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PENNSYLVANIA

GEOLOGICAL SURVEY

Fourth Series

BULLETIN M40

WELL-SAMPLE DESCRIPTIONS IN NORTHWESTERN PENNSYLVANIA AND ADJACENT STATES

by

Charles R. Fettke

DEPARTMENT OF INTERNAL AFFAIRS
Genevieve Blatt, Secretary

TOPOGRAPHIC AND GEOLOGIC SURVEY
Carlyle Gray, State Geologist

1961

FOREWORD

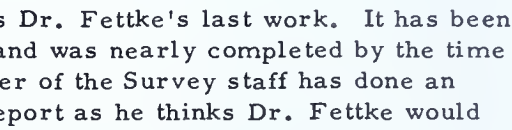
Dr. Charles R. Fettke joined the staff of the Bureau of Topographic and Geologic Survey in 1914 as a co-operating geologist. At that time he was Assistant Professor in the Department of Geology and Mineralogy at Carnegie Institute of Technology, Pittsburgh. He later became head of this Department.

Among his contributions to the profession of geology are more than 130 volumes, papers, and articles, of which 27 have been published by the Survey.

Some of his major Pennsylvania Geologic Survey works, which are standard references on the geology of Pennsylvania, are "The Bradford Oil Field," "Summarized Record of Deep Wells in Pennsylvania," "Structure Contour Maps of the Plateau Region of North-Central and Western Pennsylvania," "Oil Resources in Coals and Carbonaceous Shales of Pennsylvania," and "Occurrence of Rock Salt in Pennsylvania." Also of particular interest is Report Number 12 of the Third Survey, "Glass Manufacture and the Glass Sand Industry," a significant contribution to the economic geology of the State. Funds were available only for the field work of the glass report but it was typical of Dr. Fettke that he completed the office and laboratory work and the preparation of the 278 page manuscript at his own expense and on his own time. Dr. Fettke was intensely devoted to geology, a meticulous worker who refrained from compromising with conclusions which could not be supported by facts.

Dr. Fettke's death in 1959 was not only a great loss to the Pennsylvania Geologic Survey but also to the profession of geology. His friends and colleagues remember him as an example of great integrity, a man of broad professional knowledge, and a fine gentleman.

This publication is Dr. Fettke's last work. It has been in preparation for many years and was nearly completed by the time of his death. Mr. W. R. Wagner of the Survey staff has done an excellent job in finishing this report as he thinks Dr. Fettke would have liked it.



Genevieve Blatt, Secretary
Department of Internal Affairs

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ILLUSTRATIONS

Plates

Plate
1. Location of described wells in northwestern Pennsylvania and adjacent states ..... facing page 2

2. Cross section from Putnam County, Ohio to Erie, Pennsylvania ..... (in pocket)

3. Cross section from Erie County, Pennsylvania to Chenango County, New York ..... (in pocket)

4. Cross section from Butler County, Pennsylvania to Chenango County, New York ..... (in pocket)

WELL-SAMPLE DESCRIPTIONS IN NORTHWESTERN PENNSYLVANIA AND ADJACENT STATES

by

Charles R. Fettke

INTRODUCTION

This bulletin contains descriptions of rock cuttings obtained from wells drilled in search of oil and gas in northwestern Pennsylvania and adjacent areas. These well-sample descriptions, produced by Charles R. Fettke during the many years that he was employed by the Pennsylvania Geological Survey (as a cooperating geologist), represent the foundation of his pioneering stratigraphic studies. Although many of the well-sample descriptions have been available as "separates", they have not, until the publication of this bulletin, been combined into one volume. The bulletin incorporates 52 well-sample descriptions, a location map, and three cross sections. The location map and cross sections were begun by Dr. Fettke and completed after his death by Virginia Fairall and W. R. Wagner.

Plates 2, 3, and 4 are cross sections oriented with respect to sea level. Their geographic relations to each other are shown on the location map (Plate 1).

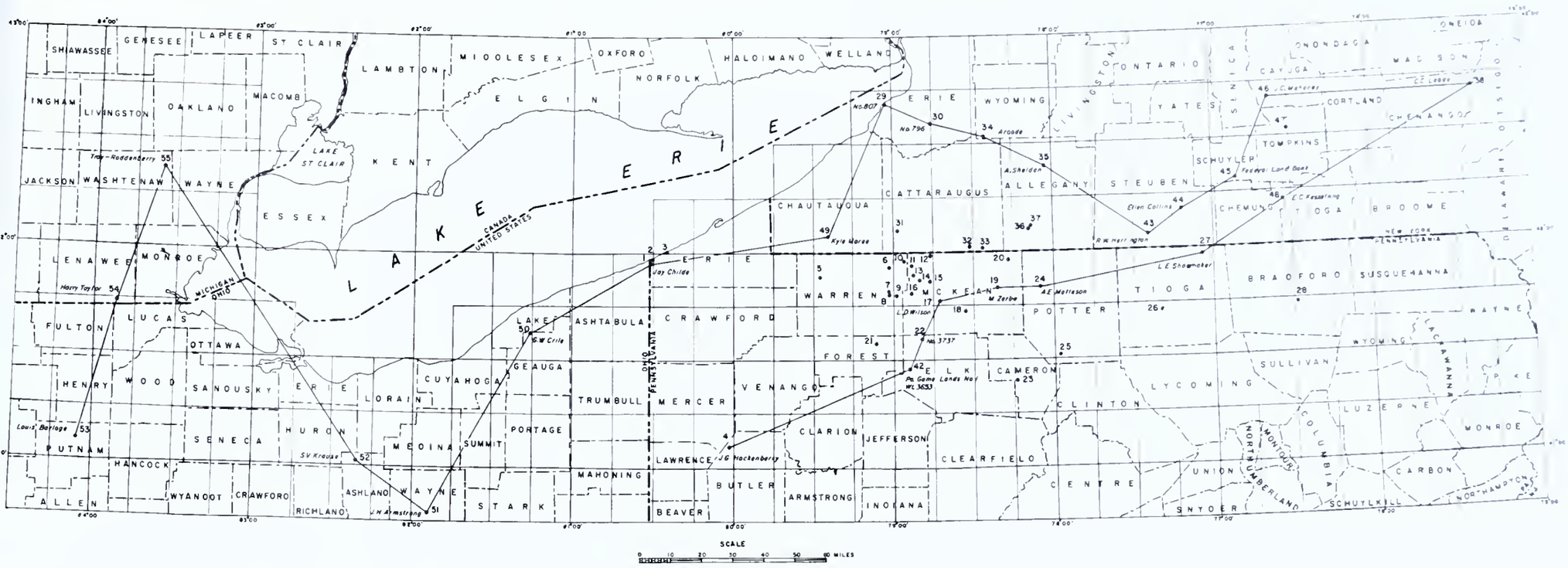
METHOD OF SAMPLE EXAMINATION AND DESCRIPTION

The rock cuttings are placed upon a watch glass, thoroughly washed, covered with water, and examined under a 10X binocular microscope. Each sample is tested with dilute hydrochloric acid for the presence of carbonates. The carbonate rocks are dissolved in hydrochloric acid and the insoluble residues are examined under binocular and polarizing microscopes. The dissolved portion is tested for presence of magnesium carbonate and calcium sulfate.

In descriptions of intervals containing more than one lithology, the subordinate rock type (or types) is denoted by use of the terms "very little", "some", "considerable", and "a great deal". The terms indicate

approximate amounts of 5%, 10%, 20%, and 40% respectively. Showings of gas, oil, and water are underlined and deposits of possible economic interest such as coal, salt, and bentonite are underscored with a dashed line.

LOCATION OF DESCRIBED WELLS IN NORTHWESTERN PENNSYLVANIA AND ADJACENT STATES



WELL NUMBER ON MAP CORRESPONDS TO NUMBER ON THUMB INDEX
NAMED WELLS ARE THOSE USED IN CROSS-SECTION

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2	N Blickensderfer No. 22
3	Frances Miles No. 3
4	Jessie G Hockenberry No.1
5	Spetz No.1
6	Charles Erickson No 1
7	Lessor & Louner No 1 Potter Development Co
8	Lessor & Louner No.1 H C Drilling Co.
9	M.W. Jamieson No 1
10	E.A. Williams No 1 Appalachian Development Corp
11	L.E. Mallory & Son No 1 Appalachian Development Corp
12	E.A Williams No 1 Hiawatha Oil & Gas Co.
13	Kinzua Valley Chemical Co. No.1
14	L.E. Mallory & Son No 1 Hiawatha Oil & Gas Co.
15	Worrant 3416 No 4 South Penn Oil Co
16	Central Pa Lumber Co No. 1
17	L.D. Wilson No 18
18	Benjamin Haywood No 1
19	M Zerbe
20	Glenn Taylor No 1
21	E Collins No 1 W.C. Wosson et al
22	Worrant 3788, No. 3737 United Natural Gas Co
23	A Pordee Estate No. 1
24	Arthur E. Matteson No. 1
25	State of Pa No. 2
26	Ida Wheeler No 1
27	Lyle E. Shoemaker No 1
28	G.H. Hellick No. 1
29	Serial No. 807 Iroquois Gas Corp
30	Serial No. 796 Iroquois Gas Corp.
31	Hotchkiss No 2
32	Ryder-Scott No 1
33	Quinton No 1
34	Arcade No 1
35	Arthur Sheldon No 1
36	T.H. Sawyer No 1
37	A. Gilbert No 1
38	Clarence C. Lobdell No. 1
42	Worrant 3653 Po Game Lands No 1
43	Roy W. Herrington No.1
44	Ellen Collins No 1 Godfrey L. Cobal, Inc.
45	Federal Land Bank
46	J C Mahoney No.1
47	Joe Farkas No.1
48	Edward C Kesselring No 1
49	Kyle Morse No. 1
50	G W Crile No 1
51	J H Armstrong No 8
52	S.V Krouse No 1
53	Louis Bortage No 1
54	Harry Taylor No 1
55	Troy-Roddenberry Comm No 1

Index by Well Name

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S V Krause No 1	52

MICHIGAN

	MAP NO
Harry Taylor No 1	54
Troy-Roddenberry Comm No 1	55

WELL-SAMPLE RECORD

NO.

1

WELL-SAMPLE RECORD

JAY CHILDS NO. 1 WELL
OHIO OIL COMPANY

Erie County, Pa., Springfield Township
Girard Quadrangle: 2.23 miles south of 42° 00' N. Lat. and .95 mile west of 80° 30' W. Long.
Completed: March 30, 1941.
Elevation: 638 feet above sea level.
Total depth: 5,191 feet
Result: Salt water at 1670 feet in Oriskany; show of gas and one barrel oil per day at 4441 feet and a little salt water at 4460 feet in Trenton; slight show of gas and oil and a little salt water, 5182 to 5188 feet, more salt water, 5188 to 5191 feet, rose 2000 feet in Gatesburg.
Samples: 0 to 5191 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Pleistocene, 60 feet	
60	Silt and clay, light gray	0 - 60
	DEVONIAN SYSTEM, 1650+ feet	
	Upper Devonian Series, 1155+ feet	
42	Siltstone, light greenish gray	60 - 102
6	Siltstone, light greenish gray, with some interbedded dark gray shale	102 - 108
32	Shale, greenish gray	108 - 140
5	Siltstone, light greenish gray	140 - 145
5	Shale, greenish gray, sandy, with considerable interbedded very dark gray shale	145 - 150
20	Shale, gray to greenish gray	150 - 170
195	Shale, gray, with some interbedded very dark gray shale	170 - 365
40	Shale, very dark gray, with considerable interbedded gray shale	365 - 405

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Shale, gray, with considerable interbedded very dark gray shale	405 - 417
6	Siltstone, greenish gray, with some interbedded very dark gray shale	417 - 423
14	Shale, gray, with a great deal of interbedded very dark gray shale	423 - 437
8	Shale, grayish black, with considerable interbedded gray shale	437 - 445
110	Shale, very dark gray, with some interbedded gray shale	445 - 555
16	Shale, gray, with considerable interbedded very dark gray shale	555 - 571
8	Shale, gray	571 - 579
8	Shale, gray, with considerable interbedded greenish-gray, slightly calcareous siltstone	579 - 587
18	Shale, gray, with a little interbedded very dark gray shale	587 - 605
8	Shale, very dark gray	605 - 613
35	Shale, very dark gray, almost black, with a little interbedded gray shale	613 - 648
21	Shale, very dark gray, with some interbedded gray shale	648 - 669
9	Shale, very dark gray, almost black	669 - 678
22	Shale, very dark gray, with a little interbedded greenish-gray shale	678 - 700
25	Shale, very dark gray, almost black	700 - 725
56	Shale, very dark gray, with some interbedded greenish-gray shale	725 - 781
24	Shale, very dark gray	781 - 805
15	Shale, very dark gray, with some interbedded greenish-gray shale	805 - 820
14	Shale, gray and very dark gray, interbedded	820 - 834

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
29	Shale, grayish black, containing a little pyrite	834 - 863
3	Shale, greenish gray, sandy and slightly calcareous	863 - 866
7	Siltstone, greenish gray, slightly calcareous	866 - 873
24	Shale, gray, slightly calcareous	873 - 897
51	Shale, greenish gray, slightly calcareous, with some interbedded dark gray shale	897 - 948
37	Shale, dark greenish gray, slightly calcareous, with some interbedded very dark gray shale	948 - 985
15	Shale, dark greenish gray, slightly calcareous, with a little interbedded grayish-black shale	985 - 1000
8	Shale, greenish gray, somewhat calcareous	1000 - 1008
8	Shale, dark greenish gray, somewhat calcareous, with a little interbedded, very fine, dense greenish and brownish-gray limestone	1008 - 1016
15	Shale, dark greenish-gray and dark gray, interbedded, slightly calcareous	1016 - 1031
29	Shale, dark greenish gray, slightly calcareous, with some interbedded dark gray shale and a little light greenish-gray calcareous siltstone	1031 - 1060
32	Shale, greenish gray, somewhat calcareous, with some interbedded very dark gray shale and a little light greenish-gray calcareous siltstone	1060 - 1092
8	Shale, dark gray, with some interbedded light greenish-gray calcareous siltstone	1092 - 1100
48	Shale, greenish gray, with some interbedded grayish-black shale and a little light gray calcareous siltstone	1100 - 1148
13	Shale, greenish gray, with some interbedded dark gray shale and a little light gray calcareous siltstone	1148 - 1161

Thickness Feet	Description of Strata	Depth in feet
7	Shale, dark gray, with some interbedded greenish-gray and grayish-black shale and a little light gray calcareous siltstone	1161 - 1168
17	Shale, brownish black	1168 - 1185
13	Shale, very dark gray, with some interbedded brownish-black shale	1185 - 1198
	Middle Devonian Series, 465 feet	
	Hamilton group, 179 feet	
17	Limestone, very fine, dense, light gray to brownish gray, argillaceous, containing fragments of shells with some interbedded gray calcareous shale	1198 - 1215
25	Shale, gray to dark gray, calcareous, containing fragments of shells, including crinoid stems, with a little interbedded very fine, dense, gray, argillaceous limestone	1215 - 1240
78	Shale, dark gray, calcareous	1240 - 1318
22	Shale, very dark gray, calcareous	1318 - 1340
8	Shale, very dark gray, somewhat calcareous	1340 - 1348
17	Shale, brownish black, somewhat calcareous	1348 - 1365
12	Shale, brownish black, calcareous	1365 - 1377
	Onondaga limestone, 286 feet	
14	Limestone, very fine, dense, very dark grayish brown, argillaceous and somewhat magnesian	1377 - 1391
37	Limestone, very fine, crystalline, light brownish gray; contains a little light brownish-gray dense chert	1391 - 1428
58	Limestone, very fine, crystalline, light brownish gray, somewhat argillaceous; contains considerable light bluish and brownish-gray dense chert	1428 - 1486

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Limestone, very fine, dense, brownish gray, somewhat argillaceous; contains considerable light bluish and brownish-gray dense chert	1486 - 1500
18	Limestone, very fine, dense, dark brownish gray, somewhat argillaceous; contains considerable light brownish-gray chert, in part minutely porous	1500 - 1518
36	Limestone, very fine, dense, grayish brown, somewhat argillaceous; contains a great deal of light brownish- to brownish-gray chert, in part minutely porous	1518 - 1554
10	Limestone, very fine, dense, dark brownish gray, somewhat argillaceous; contains considerable light brownish- to brownish-gray dense chert and fragments of shells	1554 - 1564
25	Limestone, very fine, dense, light brownish gray; contains a great deal of light brownish-gray dense chert	1564 - 1589
25	Limestone, very fine, dense, dark brownish gray; contains a great deal of light brownish-gray chert, in part minutely porous	1589 - 1614
25	Limestone, very fine, dense, brownish gray, somewhat argillaceous; contains a great deal of light brownish-gray dense chert	1614 - 1639
24	Limestone, very fine, dense, brownish gray; contains a great deal of light gray chert, in part minutely porous	1639 - 1663
	Lower Devonian Series, 47 feet	
	Oriskany sandstone, 47 feet	
7	Sandstone, medium-grained, light gray, almost white, slightly calcareous; quartz grains mostly angular to subangular; some show secondary crystal facets, some grains rounded and frosted, SALT WATER at 1670 feet	1663 - 1670
6	Sandstone, medium- to coarse-grained, light gray, somewhat calcareous; shape of grains same as above	1670 - 1676

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, medium-grained, light gray, somewhat calcareous; shape of grains same as above	1676 - 1680
5	Sandstone, medium-grained, light gray, calcareous; shape of grains same as above	1680 - 1685
3	Sandstone, medium-grained, light gray, somewhat calcareous; shape of grains same as above	1685 - 1688
7	Sandstone, fine-to medium-grained, light brownish gray, calcareous; shape of grains same as above	1688 - 1695
4	Limestone, very fine, dense, brownish gray, somewhat sandy and magnesian	1695 - 1699
11	Limestone, very fine, dense, brownish gray, somewhat sandy and magnesian; contains considerable light brownish-gray chert, in part minutely porous	1699 - 1710
	SILURIAN SYSTEM, 1083 feet	
	Upper Silurian or Cayugan Series, 547 feet	
	Cobleskill limestone, 93 feet	
5	Limestone, very fine, dense, dark brownish gray, magnesian	1710 - 1715
10	Limestone, very fine, dense, light brownish gray, magnesian	1715 - 1725
39	Limestone, very fine, crystalline, dark brownish gray, magnesian	1725 - 1764
6	Limestone, very fine, dense, gray, somewhat magnesian	1764 - 1770
12	Limestone, very fine, crystalline, light brownish gray, somewhat magnesian	1770 - 1782
21	Limestone, very fine, dense, dark brownish gray, somewhat magnesian; contains some light gray dense chert	1782 - 1803
	Salina group, 454 feet	
20	Limestone, very fine, dense, dark brownish gray, argillaceous and somewhat magnesian; contains considerable anhydrite	1803 - 1823

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
79	Limestone, very fine, dense, very dark brownish gray, argillaceous; contains considerable anhydrite	1823 - 1902
20	Limestone, very fine, dense, grayish to dark grayish brown, argillaceous; contains considerable anhydrite	1902 - 1922
27	Limestone, very fine, dense, grayish brown, argillaceous and somewhat magnesian; contains considerable anhydrite	1922 - 1949
32	Limestone, very fine, dense, very dark brownish gray, argillaceous; contains considerable anhydrite	1949 - 1981
65	Limestone, very fine, dense, dark brownish gray, argillaceous and somewhat magnesian; contains considerable anhydrite	1981 - 2046
59	Shale, greenish to dark greenish gray, with considerable interbedded very fine, dense, dark grayish-brown, argillaceous and somewhat magnesian limestone and anhydrite	2046 - 2105
25	Limestone, very fine, dense, light brownish to brownish gray, argillaceous; contains a great deal of anhydrite	2105 - 2130
40	Salt, medium-grained crystalline, colorless to white, with some interbedded very fine, dense, light brownish-gray, argillaceous and somewhat magnesian limestone	2130 - 2170
15	Salt, medium-grained, crystalline, colorless to white	2170 - 2185
25	Salt, medium-grained, crystalline, colorless to white, with a little interbedded, very fine, dense, light brownish-gray, argillaceous and somewhat magnesian limestone	2185 - 2210
14	Limestone, very fine, dense, light brownish gray, argillaceous and somewhat magnesian, with considerable interbedded salt	2210 - 2224
33	Limestone, very fine, dense, light to dark grayish brown, argillaceous; contains considerable anhydrite	2224 - 2257

Thickness Feet	Description of Strata	Depth in feet
	Middle Silurian or Niagaran Series, 367 feet	
	Lockport-Guelph dolomite, 248 feet	
35	Dolomite, very fine, crystalline to dense, dark brownish gray	2257 - 2292
36	Dolomite, very fine, crystalline to dense, grayish brown	2292 - 2328
7	Dolomite, very fine, crystalline dark grayish brown	2328 - 2335
33	Dolomite, very fine, dense, dark grayish brown	2335 - 2368
30	Dolomite, very fine, crystalline, dark grayish brown	2368 - 2398
28	Limestone, very fine, dense, brownish gray, somewhat magnesian	2398 - 2426
79	Limestone, very fine, crystalline, somewhat magnesian	2426 - 2505
	Clinton group, 119 feet	
33	Shale, dark gray, dolomitic; contains fragments of shells	2505 - 2538
18	Shale, gray, dolomitic, with a little interbedded very fine, crystalline, light gray, magnesian limestone, containing fragments of shells	2538 - 2556
43	Shale, gray, dolomitic; contains fragments of shells	2556 - 2599
11	Limestone, very fine, crystalline, light brownish gray, magnesian	2599 - 2610
8	Shale, greenish gray, with some interbedded greenish-gray, slightly calcareous siltstone	2610 - 2618
4	Limestone, very fine, crystalline, light gray, magnesian	2618 - 2622
2	Shale, greenish gray, sandy	2622 - 2624

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
	Lower Silurian or Albion Series, 169 feet	
	Grimsby sandstone, 75 feet	
6	Shale, brick red, sandy, with some interbedded light greenish-gray, somewhat calcareous siltstone	2624 - 2630
9	Sandstone, very fine-grained, light greenish gray, slightly calcareous, with a great deal of interbedded brick-red sandy shale	2630 - 2639
14	Sandstone, very fine-grained, light gray, with considerable interbedded brick-red sandy shale	2639 - 2653
7	Sandstone, very fine-grained, light gray, with some interbedded brick-red sandy and greenish-gray shale	2653 - 2660
7	Sandstone, very fine-grained, light greenish gray, with some interbedded greenish-gray shale	2660 - 2667
7	Sandstone, fine-grained, light gray, with a little interbedded greenish-gray shale	2667 - 2674
14	Sandstone, fine-grained, light gray	2674 - 2688
9	Sandstone, fine-grained, brick red	2688 - 2697
2	Sandstone, fine-grained, pink	2697 - 2699
	Cabot Head and Manitoulin members, 90 feet	
4	Sandstone, fine-grained, light greenish gray	2699 - 2703
16	Shale, gray, with considerable interbedded very fine-grained, light greenish-gray sandstone	2703 - 2719
7	Sandstone, fine to very fine-grained, light greenish gray, with some interbedded gray shale	2719 - 2726
8	Sandstone, very fine-grained, light greenish gray, with a little interbedded gray shale	2726 - 2734
6	Shale, gray, with some interbedded very fine-grained light greenish-gray sandstone	2734 - 2740

Thickness Feet	Description of Strata	Depth in feet
23	Shale, gray, with a little interbedded very fine-grained, light greenish-gray sandstone	2740 - 2763
16	Shale, gray, with some interbedded very fine-grained, light greenish-gray sandstone	2763 - 2779
10	Shale, gray, with considerable interbedded very fine-grained, light greenish-gray sandstone	2779 - 2789
	Whirlpool sandstone, 4 feet	
4	Sandstone, very fine-grained, light greenish gray, slightly calcareous, with considerable interbedded gray shale	2789 - 2793
	ORDOVICIAN SYSTEM, 2386 feet	
	Upper Ordovician or Cincinnatian Series, 1644 feet	
	Queenston shale, 833 feet	
105	Shale, brick red	2793 - 2898
112	Shale, brick red, slightly calcareous	2898 - 3010
358	Shale, brick red, somewhat calcareous, with a little interbedded greenish-gray shale	3010 - 3368
133	Shale, brick red, slightly calcareous	3368 - 3501
55	Shale, brick red, slightly calcareous, with a little interbedded greenish-gray sandy shale	3501 - 3556
70	Shale, brick red, somewhat calcareous, with some interbedded greenish-gray shale	3556 - 3626
	Reedsville shale, 679 feet	
113	Shale, greenish gray, slightly calcareous, with a little interbedded brick-red shale	3626 - 3739
83	Shale, greenish gray, slightly calcareous	3739 - 3822
53	Shale, greenish gray, somewhat calcareous, with a little interbedded, somewhat calcareous greenish-gray siltstone	3822 - 3875

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
42	Shale, dark greenish gray, with a little interbedded, greenish-gray, slightly calcareous siltstone	3875 - 3917
14	Shale, dark greenish gray, with some greenish-gray, somewhat calcareous siltstone containing fragments of shells	3917 - 3931
199	Shale, dark gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing fragments of shells	3931 - 4130
21	Shale, dark gray	4130 - 4151
24	Shale, dark gray, with a little interbedded gray, slightly calcareous siltstone containing fragments of shells	4151 - 4175
14	Shale, dark gray	4175 - 4189
116	Shale, dark gray, with a little interbedded gray, slightly calcareous siltstone	4189 - 4305
	Utica shale, 132 feet	
41	Shale, very dark gray, somewhat calcareous	4305 - 4346
74	Shale, grayish black, somewhat calcareous	4346 - 4420
17	Shale, very dark gray, slightly calcareous	4420 - 4437
	Middle Ordovician or Champlainian Series, 742 feet	
	Top of Trenton limestone	4437
25	Limestone, very fine, crystalline, light grayish brown, slightly magnesian; SHOW OF OIL, about one barrel per day, at 4441 and a LITTLE SALT WATER at 4460 feet	4437 - 4462
17	Limestone, very fine, dense, very dark grayish brown, somewhat argillaceous, with considerable interbedded very fine, crystalline, light grayish-brown limestone containing fragments of shells	4462 - 4479
45	Limestone, very fine, dense, very dark brownish gray, somewhat argillaceous, containing fragments of shells	4479 - 4524

Thickness Feet	Description of Strata	Depth in feet
24	Limestone, very fine, dense, very dark brownish gray, argillaceous, containing fragments of shells	4524 - 4548
42	Limestone, very fine, dense, light to dark brownish gray, argillaceous, containing fragments of shells	4548 - 4590
17	Limestone, very fine, dense, very dark brownish gray, argillaceous	4590 - 4607
10	Shale, grayish black, calcareous, with considerable interbedded very fine, dense, very dark brownish-gray, argillaceous limestone	4607 - 4617
59	Limestone, very fine, dense, very dark brownish gray, argillaceous, containing occasional fragments of shells	4617 - 4676
46	Limestone, very fine, dense, very dark brownish gray, somewhat argillaceous, containing fragments of shells	4676 - 4722
40	Limestone, very fine, crystalline, grayish brown, containing abundant fragments of shells, with some interbedded very fine, dense, very dark brownish-gray, somewhat argillaceous limestone	4722 - 4762
11	Limestone, very fine, dense, dark grayish brown, argillaceous, containing fragments of shells and a little brownish gray chert	4762 - 4773
7	Limestone, very fine, dense, dark grayish brown, argillaceous, containing fragments of shells and considerable brownish-gray chert, with some interbedded light gray bentonite	4773 - 4780
11	Limestone, very fine, dense, dark grayish brown, argillaceous, containing fragments of shells, with considerable interbedded light gray bentonite	4780 - 4791
11	Limestone, very fine, dense, grayish brown, argillaceous, with a little interbedded light gray bentonite	4791 - 4802
11	Bentonite, light gray, with a little interbedded, very fine, dense, grayish-brown, argillaceous limestone	4802 - 4813

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Bentonite, light gray, with some interbedded, very fine, dense, grayish brown, argillaceous limestone	4813 - 4820
10	Limestone, very fine, dense, grayish brown, argillaceous, with considerable interbedded light gray bentonite; limestone contains some brownish-gray chert	4820 - 4830
150	Limestone, very fine, dense, grayish brown, contains a little brownish-gray chert and occasional fragments of shells	4830 - 4980
13	Limestone, very fine, crystalline, grayish brown, somewhat magnesian; contains minutely porous light gray chert	4980 - 4993
34	Limestone, very fine, dense, grayish brown, contains occasional fragments of shells	4993 - 5027
50	Limestone, very fine, dense, dark grayish brown, contains occasional fragments of shells	5027 - 5077
13	Limestone, very fine, dense, dark brownish gray, somewhat argillaceous	5077 - 5090
13	Limestone, very fine, dense, gray to dark greenish gray, argillaceous	5090 - 5103
7	Limestone, very fine, dense, dark brownish gray, argillaceous	5103 - 5110
27	Limestone, very fine, dense, grayish brown, contains occasional fragments of shells	5110 - 5137
13	Limestone, very fine, dense, dark grayish brown	5137 - 5150
6	Limestone, very fine, crystalline, dark grayish brown, sandy and argillaceous; fine quartz grains mostly subangular, but some are subrounded to rounded and frosted	5150 - 5156
5	Limestone, very fine, dense, dark gray, shaly	5156 - 5161
4	Limestone, very fine, crystalline, dark grayish brown, somewhat argillaceous	5161 - 5165

Childs No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Limestone, very fine, dense, very dark brownish gray, somewhat argillaceous and magnesian	5165 - 5171
8	Shale, gray	5171 - 5179
	CAMBRIAN SYSTEM, 12+ feet	
	Upper Cambrian Series, 12+ feet	
	Gatesburg sandstone, 12+ feet	
5	Sandstone, fine-to medium-grained, light gray to white, somewhat dolomitic; quartz grains subrounded to rounded and frosted	5179 - 5184
7	Sandstone, fine- to medium-grained, light gray to white; quartz grains subrounded to rounded and frosted; SLIGHT SHOW OF GAS and OIL and a LITTLE SALT WATER, 5185 to 5188 feet, MORE SALT WATER, 5188 to 5191 feet, rose 2000 feet in hole	5184 - 5191
	TOTAL DEPTH	5191

WELL-SAMPLE RECORD

NO.

2

WELL-SAMPLE RECORD

N. BLICKENSDERFER NO. 22 WELL
THE OHIO OIL COMPANY

Erie County, Pa., Springfield Township
Girard Quadrangle: 1.74 miles south of 42° 00' N. Lat. and .09 mile west of 80° 30' W. Long.
Completed: April 10, 1942.
Elevation: 642 feet above sea level.
Total depth: 4,457 feet
Result: Hole full of salt water at 1662 feet in Oriskany; four bailers of salt water per hour, 2422-2431 feet, in Lockport; show of gas at 2652 feet in Cabot Head; salt water at 4457 feet in Trenton, rose 300 feet in one hour.
Samples: 68 to 4457 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Pleistocene, 68 feet	
68	No samples	0 - 68
	DEVONIAN SYSTEM, 1627+ feet	
	Upper Devonian Series, 1152+ feet	
53	Shale, very dark gray, silty, with considerable interbedded gray shale	68 - 121
179	Shale, very dark gray, with considerable interbedded greenish-gray shale, in part silty; 2 1/2 bailers of water per hour at 125 feet	121 - 300
40	Shale, greenish gray, in part silty, containing occasional fragments of shells with some interbedded very dark gray shale	300 - 340
20	Shale, dark to very dark gray, with some interbedded gray shale	340 - 360
20	Shale, grayish black, with some interbedded dark gray shale	360 - 380
35	Shale, very dark gray, with a little interbedded greenish-gray silty shale	380 - 415

Thickness Feet	Description of Strata	Depth in feet
80	Shale, very dark gray to grayish black, with some interbedded gray shale	415 - 495
65	Shale, very dark gray, with some interbedded gray shale and a little greenish-gray, slightly calcareous siltstone	495 - 560
20	Shale, gray to dark gray, in part somewhat calcareous, with a little interbedded very dark gray shale	560 - 580
70	Shale, brownish black, with a little interbedded greenish-gray silty shale	580 - 650
30	Shale, very dark brownish gray, with some interbedded greenish-gray, slightly calcareous shale	650 - 680
60	Shale, very dark brownish gray, with a little interbedded greenish-gray, silty shale	680 - 740
30	Shale, very dark gray, with some interbedded greenish-gray shale	740 - 770
30	Shale, very dark gray to grayish black	770 - 800
30	Shale, very dark gray, with considerable interbedded gray shale	800 - 830
30	Shale, grayish black	830 - 860
100	Shale, grayish black, with a little interbedded greenish-gray shale	860 - 960
60	Shale, very dark gray to grayish black, with some interbedded greenish-gray shale	960 - 1020
80	Shale, gray to greenish gray, slightly calcareous	1020 - 1100
60	Shale, greenish gray, slightly calcareous, with considerable interbedded dark to very dark gray shale	1100 - 1160
60	Shale, brownish black	1160 - 1220
	Middle Devonian Series, 442 feet	
	Hamilton group, 158 feet	
10	Shale, dark gray, calcareous	1220 - 1230

Blickensderfer No. 22

Thickness Feet	Description of Strata	Depth in feet
10	Shale, gray, calcareous, with a little interbedded very fine, gray, argillaceous limestone	1230 - 1240
50	Shale, gray, calcareous, with considerable interbedded grayish-black shale	1240 - 1290
20	Shale, dark gray, somewhat calcareous	1290 - 1310
68	Shale, very dark gray, slightly calcareous	1310 - 1378
	Onondaga limestone, 284 feet	
36	Limestone, very fine, crystalline, light to very dark brownish gray, somewhat argillaceous	1378 - 1414
20	Limestone, very fine, brownish gray, somewhat argillaceous, containing light gray vitreous chert	1414 - 1434
66	Limestone, very fine, light brownish gray, somewhat argillaceous, containing a little light gray vitreous chert	1434 - 1500
18	Limestone, very fine, brownish gray, containing considerable brownish gray vitreous chert	1500 - 1518
47	Limestone, very fine, light brownish gray, somewhat argillaceous, containing a little very fine, light gray vitreous chert	1518 - 1565
20	Limestone, very fine, light brownish gray, containing a great deal of light gray to brownish-gray vitreous chert	1565 - 1585
43	Limestone, very fine, brownish gray, somewhat argillaceous, containing considerable light gray to brownish-gray vitreous chert	1585 - 1628
34	Limestone, very fine, light brownish gray, containing considerable light gray, vitreous chert	1628 - 1662

Thickness Feet	Description of Strata	Depth in feet
	Lower Devonian Series	
	Oriskany sandstone, 33 feet	
16	Sandstone, coarse-grained, light gray, slightly calcareous, with many of quartz grains subrounded to rounded and frosted; hole full of SALT WATER at 1662 feet	1662 - 1678
14	Sandstone, very fine-grained, light brownish gray, most of quartz grains angular, calcareous	1678 - 1682
13	Limestone, very fine, light brownish to brownish gray, sandy, and somewhat magnesian	1682 - 1695
	SILURIAN SYSTEM, 1085 feet	
	Upper Silurian or Cayugan Series, 591 feet	
	Cobleskill limestone, 120 feet	
5	Limestone, very fine, light brownish to brownish gray, somewhat argillaceous and magnesian	1695 - 1700
7	Limestone, very fine, very light brownish gray, magnesian	1700 - 1707
23	Limestone, very fine, light brownish gray, dolomitic and somewhat argillaceous	1707 - 1730
23	Limestone, very fine, crystalline, brownish gray, dolomitic	1730 - 1753
62	Limestone, very fine, brownish gray, dolomitic and somewhat argillaceous	1753 - 1815
	Salina group, 471 feet	
10	Limestone, very fine, gray to dark gray, shaly, and dolomitic, with a little interbedded very fine, crystalline light gray anhydrite	1815 - 1825
37	Shale, dark greenish gray, dolomitic, with some interbedded very fine, brownish-gray argillaceous and dolomitic limestone, containing a little light gray anhydrite	1825 - 1862

Blickensderfer No. 22

Thickness Feet	Description of Strata	Depth in feet
38	Limestone, very fine, dark grayish brown, argillaceous and dolomitic, with some interbedded dark greenish-gray dolomitic shale, and some very fine, crystalline, light gray anhydrite	1862 - 1900
20	Limestone, very fine, gray, argillaceous and dolomitic, with considerable interbedded very fine, grayish brown argillaceous and dolomitic limestone and a little light gray anhydrite	1900 - 1920
100	Dolomite, very fine, grayish brown, somewhat argillaceous, containing some anhydrite	1920 - 2020
10	Limestone, very fine, dark grayish brown, dolomitic and somewhat argillaceous, with considerable interbedded gray, argillaceous and dolomitic limestone and a little anhydrite	2020 - 2030
48	Shale, greenish gray, somewhat dolomitic, with considerable interbedded very fine, dark brownish-gray dolomitic and somewhat argillaceous limestone	2030 - 2078
25	Dolomite, very fine, dark brownish gray, somewhat argillaceous, with some interbedded greenish-gray, somewhat dolomitic shale	2078 - 2103
12	Dolomite, very fine, light grayish brown, argillaceous, containing a little anhydrite	2103 - 2115
6	Anhydrite, very fine, crystalline, light brownish gray	2115 - 2121
29	Salt, coarse, crystalline, light gray, with considerable interbedded light grayish-brown, somewhat dolomitic clay	2121 - 2150
13	Salt, coarse, crystalline, light gray, with some interbedded light grayish-brown, somewhat dolomitic clay	2150 - 2163
11	Salt, coarse, crystalline, light gray	2163 - 2174
12	Clay, light grayish brown, somewhat dolomitic, containing a great deal of anhydrite	2174 - 2186

Thickness Feet	Description of Strata	Depth in feet
9	Salt, coarse, crystalline, light gray, with a little interbedded greenish-gray, some what dolomitic shale	2186 - 2195
21	Clay, light grayish brown, somewhat dolomitic	2195 - 2216
64	Limestone, very fine, light to dark grayish brown, argillaceous and dolomitic, containing some anhydrite	2216 - 2280
6	Dolomite, very fine, crystalline, dark grayish brown, containing a little anhydrite	2280 - 2286
	Middle Silurian or Niagaran Series, 329 feet	
	Lockport-Guelph dolomite, 225 feet	
37	Limestone, very fine, light brownish to brownish gray, dolomitic and somewhat argillaceous	2286 - 2323
12	Limestone, very fine, crystalline, dark brownish gray, dolomitic and somewhat argillaceous	2323 - 2335
18	Limestone, very fine, light to dark brownish gray, dolomitic and somewhat argillaceous	2335 - 2353
35	Limestone, very fine, light gray to grayish brown, dolomitic	2353 - 2388
16	Limestone, very fine, crystalline, light to dark grayish brown, dolomitic	2388 - 2404
39	Limestone, very fine, crystalline, grayish brown, dolomitic; 4 bailers SALT WATER per hour at 2422-2431 feet in Lockport	2404 - 2443
43	Limestone, very fine, crystalline, brownish gray, dolomitic	2443 - 2486
25	Limestone, very fine, crystalline, dark brownish gray, dolomitic and argillaceous	2486 - 2511
	Clinton group, 104 feet	
26	Shale, dark gray, slightly dolomitic, with considerable interbedded, very fine, crystalline, dark brownish-gray argillaceous and dolomitic limestone	2511 - 2537

Blickensderfer No. 22

Thickness Feet	Description of Strata	Depth in feet
29	Shale, dark gray, slightly dolomitic, containing fragments of shells	2537 - 2566
20	Shale, gray, somewhat dolomitic	2566 - 2586
11	Limestone, very fine, light brownish gray, dolomitic and somewhat argillaceous and silty	2586 - 2597
3	Siltstone, gray, containing a little glauconite, with some interbedded greenish-gray shale	2597 - 2600
5	Limestone, very fine, very light brownish gray, ferruginous, sandy and silty, containing a little glauconite	2600 - 2605
10	Shale, greenish gray, silty	2605 - 2615
	Lower Silurian or Albion Series, 165 feet	
	Grimsby member, 30 feet	
19	Shale, brick red, silty, with considerable interbedded very fine-grained, light brownish-gray sandstone	2615 - 2634
11	Sandstone, very fine-grained, light gray, with a little interbedded brick-red, in part silty, shale	2634 - 2645
	Cabot Head and Manitoulin members, 135 feet	
12	Shale, gray, with a great deal of interbedded, very fine-grained, light gray sandstone; show of GAS at 2652 feet	2645 - 2657
3	Sandstone, very fine-grained, light gray, with some interbedded greenish-gray silty shale	2657 - 2660
5	Sandstone, very fine-grained, light gray	2660 - 2665
7	Sandstone, very fine-grained, light gray to pink, with a little interbedded gray silty shale	2665 - 2672
7	Shale, greenish gray, in part silty, with considerable interbedded very fine-grained light gray to pink sandstone	2672 - 2679

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine-grained, light gray, with considerable interbedded reddish-gray silty shale and some greenish-gray shale	2679 - 2684
4	Shale, greenish gray, with considerable interbedded reddish-gray silty shale	2684 - 2688
10	Sandstone, very fine, light gray, hard, with a great deal of interbedded greenish-gray shale	2688 - 2698
18	Shale, gray, with considerable interbedded greenish-gray siltstone and a little very fine-grained, light gray sandstone	2698 - 2716
12	Sandstone, very fine-grained, light gray, hard, with a great deal of interbedded greenish-gray shale	2716 - 2728
39	Shale, gray, with considerable interbedded light greenish-gray siltstone	2728 - 2767
13	Siltstone, light greenish gray, with some interbedded gray shale	2767 - 2780
	ORDOVICIAN SYSTEM, 1677+ feet	
	Upper Ordovician or Cincinnatian Series, 1617 feet	
	Queenston shale, 846 feet	
55	Shale, brick red	2780 - 2835
393	Shale, brick red, with a little interbedded greenish-gray silty shale	2835 - 3228
378	Shale, brick red, slightly calcareous, with a little interbedded greenish-gray, in part silty and slightly calcareous shale	3228 - 3606
20	Shale, greenish gray, slightly calcareous, with considerable interbedded brick-red, slightly calcareous shale	3606 - 3626
	Reedsville shale, 664 feet	
40	Shale, greenish gray, containing occasional fragments of shells, with a little interbedded greenish-gray, somewhat calcareous siltstone containing occasional fragments of shells and a little brick-red shale	3626 - 3666

Hickensderfer No. 22

Thickness Feet	Description of Strata	Depth in feet
119	Shale, greenish gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing fragments of shells	3666 - 3785
425	Shale, dark gray, with a little interbedded, gray, somewhat calcareous siltstone, containing fragments of shells	3785 - 4210
80	Shale, dark gray, with some interbedded very dark gray shale and a little gray, slightly calcareous siltstone	4210 - 4290
	Utica shale, 107 feet	
30	Shale, very dark gray, somewhat calcareous, with a little interbedded gray shale	4290 - 4320
35	Shale, very dark gray, somewhat calcareous	4320 - 4355
23	Shale, very dark gray to grayish black, slightly calcareous, with a little interbedded gray silty shale containing fragments of shells	4355 - 4378
19	Shale, very dark gray to grayish black, slightly calcareous	4378 - 4397
	Middle Ordovician or Champlainian Series, 60+ feet	
	Top of Trenton limestone	4397
6	Limestone, very fine, crystalline, light gray, with considerable interbedded gray to dark gray shale	4397 - 4403
10	Shale, dark gray, with considerable interbedded, very fine, crystalline, very light brownish-gray limestone	4403 - 4413
23	Limestone, very fine, crystalline, very light brownish gray, somewhat argillaceous, with a great deal of interbedded dark gray shale	4413 - 4436
21	Limestone, very fine, mottled light gray and dark brownish gray, argillaceous, containing abundant fragments of shells; SALT WATER at 4457 feet, rose 300 feet in one hour	4436 - 4457
	TOTAL DEPTH	4457

WELL-SAMPLE RECORD
NO.
3

WELL-SAMPLE RECORD

FRANCES MILES NO. 3 WELL
NEW PENN DEVELOPMENT CORPORATION

Erie County, Pa., Springfield Township
Fairview Quadrangle: .24 mile north of 42° 00' N. Lat. and .95 mile west of 80° 25' W. Long.
Completed: 1933
Elevation: 593 feet above sea level.
Total depth: 2575 feet
Result: Salt water in Oriskany; black salt water, 2280-2357 feet in Lockport; 55,000 cubic feet of gas per day, initial open flow at 2520 feet in Whirlpool.
Samples: 25 to 2554 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
25	No samples	0 - 25
	From drillers' log	
	Pleistocene, 8 feet	
8	Gravel	0 - 8
	DEVONIAN SYSTEM, 1627+ feet	
	Upper Devonian Series, 1122+ feet	
17	Slate and shells	8 - 25
	Well-sample record	
19	Sandstone, very fine-grained, light greenish gray	25 - 44
8	Sandstone, very fine-grained, light greenish gray, with a little interbedded greenish-gray sandy shale	44 - 52
18	Shale, light greenish gray, sandy, with a little interbedded dark gray shale	52 - 70
9	Sandstone, very fine-grained, light greenish gray, with a little interbedded dark gray shale	70 - 79

Thickness Feet	Description of Strata	Depth in feet
5	Shale, light greenish gray, sandy	79 - 84
9	Shale, very dark gray, with some interbedded greenish-gray sandy shale	84 - 93
27	Shale, light greenish to greenish gray, sandy	93 - 120
5	Sandstone, very fine-grained, light greenish gray	120 - 125
20	Shale, light greenish gray, sandy, with some interbedded very dark gray shale	125 - 145
24	Shale, light greenish gray	145 - 169
16	Shale, light greenish gray, sandy, with some interbedded dark gray shale	169 - 185
19	Shale, light greenish gray, with a little interbedded very dark gray shale	185 - 204
5	Shale, very dark gray	204 - 209
25	Shale, light greenish gray, sandy, with a little interbedded very dark gray shale	209 - 234
5	Shale, gray	234 - 239
9	Shale, very dark gray, almost black	239 - 248
42	Shale, gray to very dark gray	248 - 290
5	Shale, greenish gray, sandy	290 - 295
5	Shale, very dark gray	295 - 300
5	Shale, grayish black	300 - 305
5	Shale, very dark gray, almost black	305 - 310
19	Shale, greenish gray, sandy, with considerable interbedded very dark gray shale	310 - 329
20	Shale, light gray, with some interbedded very dark gray shale	329 - 349
32	Shale, very dark gray, with some interbedded light gray shale	349 - 381
11	Shale, light greenish gray, sandy, with some interbedded very dark gray shale	381 - 392

Miles No. 3

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine-grained, light greenish gray, somewhat calcareous	392 - 398
11	Shale, very dark gray	398 - 409
11	Shale, grayish black	409 - 420
14	Shale, very dark gray	420 - 434
17	Shale, gray, with some interbedded greenish-gray sandy shale	434 - 451
20	Shale, gray, with some interbedded very dark gray shale	451 - 471
40	Shale, grayish black	471 - 511
21	Shale, very dark gray	511 - 532
5	Shale, grayish black	532 - 537
24	Shale, very dark gray	537 - 561
10	Shale, dark gray	561 - 571
10	Shale, brownish black	571 - 581
19	Shale, very dark gray	581 - 600
38	Shale, grayish black	600 - 638
5	Shale, gray	638 - 643
5	Shale, grayish black	643 - 648
9	Shale, gray to dark gray	648 - 657
9	Shale, brownish black	657 - 666
10	Shale, grayish black, with some interbedded gray shale	666 - 676
10	Shale, grayish black, with considerable interbedded greenish-gray sandy shale	676 - 686
25	Shale, very dark gray	686 - 711
10	Shale, greenish gray	711 - 721
5	Shale, very dark brownish gray	721 - 726

Thickness Feet	Description of Strata	Depth in feet
5	Shale, brownish black	726 - 731
10	Shale, grayish black	731 - 741
6	Shale, black; contains considerable pyrite	741 - 747
30	Shale, greenish gray, sandy	747 - 777
53	Shale, greenish gray, with some interbedded brownish-black shale	777 - 830
19	Shale, greenish gray, sandy, somewhat calcareous	830 - 849
16	Shale, gray	849 - 865
16	Shale, black	865 - 881
14	Shale, greenish gray, sandy, somewhat calcareous, with a little interbedded grayish-black shale	881 - 895
8	Shale, gray, somewhat calcareous	895 - 903
28	Shale, dark gray, with some interbedded dark greenish-gray sandy shale	903 - 931
15	Shale, greenish gray, sandy, slightly calcareous	931 - 946
17	Shale, dark to very dark gray, with some interbedded greenish-gray sandy shale	946 - 963
5	Shale, grayish black	963 - 968
51	Shale, greenish gray, sandy, somewhat calcareous, with some interbedded grayish-black shale	968 - 1019
5	Shale, grayish black	1019 - 1024
10	Shale, greenish gray, sandy, somewhat calcareous, with some interbedded very dark gray shale	1024 - 1034
42	Shale, dark gray, slightly calcareous	1034 - 1076
40	Shale, brownish black	1076 - 1116
5	Shale, dark grayish brown	1116 - 1121

Thickness Feet	Description of Strata	Depth in feet
6	Shale, grayish black, somewhat calcareous	1121 - 1127
3	Shale, brownish black, somewhat calcareous	1127 - 1130
	Middle Devonian Series, 452 feet	
	Hamilton group, 172 feet	
4	Limestone, very fine, dense, light brown to brown; contains fragments of shells	1130 - 1134
10	Shale, dark brownish gray to brownish black, somewhat calcareous	1134 - 1144
4	Limestone, very fine, dense, dark brownish gray, contains fragments of shells	1144 - 1148
19	Shale, dark gray, calcareous; contains fragments of shells including crinoid stems	1148 - 1167
29	Shale, dark gray, calcareous	1167 - 1196
35	Shale, dark gray, somewhat calcareous	1196 - 1231
33	Shale, dark gray, calcareous	1231 - 1264
11	Shale, very dark gray, calcareous	1264 - 1275
10	Shale, very dark gray, calcareous, with some interbedded brownish-black shale	1275 - 1285
17	Shale, brownish black, somewhat calcareous	1285 - 1302
	Onondaga limestone, 280 feet	
5	Limestone, very fine, crystalline, dark grayish brown, argillaceous; contains fragments of shells	1302 - 1307
110	Limestone, very fine, crystalline, light to very light grayish brown, cherty and silty; contains fragments of shells	1307 - 1417
15	Limestone, very fine, dense, dark grayish brown, cherty and silty; contains fragments of shells	1417 - 1432
19	Limestone, very fine, dense, grayish brown, cherty and somewhat silty	1432 - 1451

Thickness Feet	Description of Strata	Depth in feet
15	Limestone, very fine, crystalline, light grayish brown, cherty and somewhat silty	1451 - 1466
67	Limestone, very fine, crystalline, grayish to dark grayish brown, cherty and somewhat silty; contains fragments of shells	1466 - 1533
31	Limestone, very fine, crystalline, light grayish brown, cherty and somewhat silty	1533 - 1564
18	Chert, very fine, dense, light brownish gray, calcareous, and considerable siltstone	1564 - 1582
	Lower Devonian Series, 53 feet	
	Oriskany sandstone, 53 feet	
10	Sandstone, medium-grained, white, slightly calcareous; many of quartz grains well rounded, some show secondary crystal facets, SALT WATER	1582 - 1592
3	Sandstone, medium-grained, light gray, calcareous	1592 - 1595
3	Sandstone, medium-grained, grayish brown, very calcareous	1595 - 1598
9	Limestone, very fine, crystalline, grayish to dark grayish brown, sandy	1598 - 1607
28	Limestone, very fine, crystalline, light grayish to grayish brown, cherty and silty	1607 - 1635
	SILURIAN SYSTEM, 929 feet	
	Upper Silurian or Cayugan Series, 519 feet	
	Cobleskill limestone, 69 feet	
33	Limestone, very fine, crystalline, light grayish to grayish brown, somewhat dolomitic and argillaceous	1635 - 1668
36	Limestone, very fine, crystalline, grayish brown, dolomitic and somewhat argillaceous	1668 - 1704

Thickness Feet	Description of Strata	Depth in feet
	Salina group, 450 feet	
20	Limestone, very fine, crystalline, dark to very dark grayish brown, argillaceous; contains considerable anhydrite	1704 - 1724
4	Limestone, very fine, crystalline, light grayish brown; contains a great deal of anhydrite	1724 - 1728
39	Limestone, very fine, crystalline, gray to dark grayish brown, argillaceous; contains some anhydrite	1728 - 1767
30	Limestone, very fine, crystalline, dark grayish brown, argillaceous; contains a little anhydrite	1767 - 1797
16	Limestone, very fine, dense, brown to dark grayish brown, argillaceous; contains some anhydrite	1797 - 1813
64	Limestone, very fine, dense, light to dark brownish gray, argillaceous and somewhat dolomitic	1813 - 1877
16	Dolomite, very fine, crystalline, light brown, somewhat argillaceous; contains considerable anhydrite	1877 - 1893
6	Limestone, very fine, dense, brown, argillaceous and somewhat dolomitic; contains considerable anhydrite	1893 - 1899
35	Limestone, very fine, crystalline, brown, argillaceous and somewhat dolomitic; contains considerable anhydrite	1899 - 1934
12	Limestone, very fine, crystalline, dark brown, argillaceous; contains some anhydrite	1934 - 1946
33	Shale, dark greenish gray, somewhat calcareous	1946 - 1979
23	Limestone, very fine, dense, dark brownish gray, argillaceous and dolomitic; contains considerable anhydrite	1979 - 2002
17	Limestone, very fine, crystalline, brown to dark brown, argillaceous and dolomitic; contains some anhydrite	2002 - 2019

Thickness Feet	Description of Strata	Depth in feet
10	Limestone, very fine, dense, brownish gray, argillaceous and dolomitic	2019 - 2029
12	Salt, coarse, crystalline, light gray	2029 - 2041
7	Clay, light grayish brown, calcareous; contains considerable anhydrite	2041 - 2048
86	Limestone, very fine, dense, dark to very dark grayish brown, argillaceous; contains considerable anhydrite	2048 - 2134
8	Shale, brownish black, slightly calcareous	2134 - 2142
10	Limestone, very fine, dense, dark grayish brown, argillaceous; contains considerable anhydrite	2142 - 2152
2	Shale, brownish black	2152 - 2154
	Middle Silurian or Niagaran Series, 342 feet	
	Lockport-Guelph dolomite, 242 feet	
23	Limestone, very fine, crystalline, brown to dark grayish brown, dolomitic	2154 - 2177
103	Dolomite, very fine, crystalline, grayish brown	2177 - 2280
87	Limestone, very fine, crystalline, dark to very dark grayish brown, dolomitic; black SALT WATER encountered in this limestone	2280 - 2367
29	Limestone, very fine, crystalline, light brownish to brownish gray, dolomitic	2367 - 2396
	Clinton group, 100 feet	
10	Shale, dark gray, dolomitic	2396 - 2406
4	Limestone, very fine, crystalline, brownish gray, argillaceous, and somewhat dolomitic	2406 - 2410
42	Shale, dark gray, somewhat dolomitic	2410 - 2452
11	Shale, gray, somewhat dolomitic	2452 - 2463
7	Limestone, very fine, crystalline, brownish gray, argillaceous and somewhat dolomitic	2463 - 2470

Miles No. 3

Thickness Feet	Description of Strata	Depth in feet
10	Shale, greenish gray	2470 - 2480
4	Limestone, very fine, crystalline, light brownish gray, sandy and somewhat dolomitic; contains some glauconite	2480 - 2484
3	Sandstone, very fine-grained, light greenish gray, somewhat dolomitic; contains some glauconite	2484 - 2487
9	Shale, brick red and greenish gray	2487 - 2496
	Lower Silurian or Albion Series, 68 feet	
	Thorold sandstone, 6 feet	
6	Sandstone, very fine-grained, light gray, somewhat calcareous	2496 - 2502
	Grimsby member, 6 feet	
6	Shale, dark brick red, sandy	2502 - 2508
	Whirlpool sandstone, 56 feet	
17	Sandstone, very fine-grained, light greenish gray; INITIAL OPEN FLOW OF 55,000 CUBIC FEET OF GAS encountered at 2520 feet	2508 - 2525
7	Sandstone, very fine-grained, light gray, with a little interbedded greenish-gray shale	2525 - 2532
16	Sandstone, very fine-grained, light gray, with some interbedded dark greenish-gray shale	2532 - 2548
6	Sandstone, very fine-grained, light gray	2548 - 2554
21	No samples	2554 - 2575
	From drillers' log	
10	Sand	2554 - 2564
	ORDOVICIAN SYSTEM, 11+ feet	
	Upper Ordovician or Cincinnatian Series, 11+ feet	
	Queenston shale, 11+ feet	
11	Shale, red	2564 - 2575
	TOTAL DEPTH	2575

WELL-SAMPLE RECORD

NO.

4

WELL-SAMPLE RECORD

JESSIE G. HOCKENBERRY NO. 1 WELL
MANUFACTURERS LIGHT AND HEAT COMPANY

Butler County, Pa., Mercer Township
Mercer Quadrangle: 1.60 miles north of 41° 5' N. Lat. and 2.13 miles west of 80° 00' W. Long.
Completed: November 10, 1944.
Elevation: 1306 feet above sea level.
Total depth: 10,096 feet.
Result: Show of gas, 9505-9510 feet, in Middle Ordovician; good show of gas, 9746-9771 feet, in Upper Cambrian, acidized without results; one bailer of salt water per hour at 10,092 feet in Gatesburg sandstone.
Samples: 0 to 10,096 feet examined by Chas. R. Fettke.

Thickness Feet	Description of strata	Depth in feet
	Wisconsin till, 28+ feet	
28	Sand and gravel, coarse, pebbles consist mostly of sandstone	0 - 28
	PENNSYLVANIAN SYSTEM, 224+ feet	
	Upper Pottsville-Kanawha Series, 224+ feet	
28	Limestone, very fine, dense, brownish gray, Vanport	28 - 56
1	Shale, dark gray, silty, with a little interbedded coal	56 - 57
23	Sandstone, fine-grained, light gray, in part stained yellowish brown by weathering, containing some muscovite	57 - 80
1	Coal, bony	80 - 81
19	Shale, gray, sandy, containing some muscovite	81 - 100
10	Shale, very dark gray, silty, containing some muscovite and minute fragments of carbonized plant remains	100 - 110
5	Shale, black	110 - 115

Thickness Feet	Description of Strata	Depth in feet
7	Shale, very dark gray	115 - 122
3	Shale, gray, sandy, containing some muscovite and minute fragments of carbonized plant remains	122 - 125
6	Shale, very dark gray, with some interbedded coal and gray claystone	125 - 131
8	Shale, gray to dark gray, sandy, containing some muscovite and minute fragments of carbonized plant remains	131 - 139
9	Shale, dark gray	139 - 148
3	Shale, very dark gray to grayish black	148 - 151
14	Shale, dark gray, silty	151 - 165
4	Sandstone, fine-grained, light gray, with a little interbedded black shale and coal	165 - 169
15	Shale, dark gray, silty, containing some minute fragments of carbonized plant remains, with considerable interbedded fine-grained, light gray sandstone	169 - 184
12	Shale, very dark gray, silty, containing some muscovite and minute fragments of carbonized plant remains	184 - 196
11	Sandstone, fine-grained, light gray, containing a little muscovite	196 - 207
10	Shale, dark gray, silty, containing some muscovite and minute fragments of carbonized plant remains	207 - 217
6	Shale, very dark gray, in part silty, with a little interbedded coal	217 - 223
5	Claystone, dark grayish brown	223 - 228
5	Sandstone, medium-grained, brownish gray, with considerable interbedded dark gray silty shale	228 - 233
6	Sandstone, medium-grained, light gray, poorly sorted, with some well rounded quartz grains	233 - 239
13	Shale, dark gray, silty, containing some muscovite	239 - 252

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 569 feet	
	Pocono group, 569 feet	
18	Sandstone, fine-grained, light gray, containing some muscovite	252 - 270
37	Sandstone, fine to medium-grained, light gray, containing a little muscovite	270 - 307
23	Sandstone, very fine to fine-grained, light gray, containing a little muscovite	307 - 330
6	Sandstone, fine to medium-grained, light gray, friable, with considerable interbedded dark gray, silty shale	330 - 336
7	Sandstone, fine to medium-grained, light gray, containing some muscovite	336 - 343
7	Sandstone, fine to medium-grained, light gray, containing some muscovite and minute fragments of carbonized plant remains, with considerable interbedded dark gray, silty shale	343 - 350
18	Sandstone, fine-grained, light gray, nearly white, containing a little muscovite	350 - 368
25	Sandstone, fine-grained, light greenish gray, containing some muscovite	368 - 393
51	Shale, dark greenish gray, silty, with some interbedded greenish gray siltstone, containing some muscovite and minute fragments of carbonized plant remains	393 - 444
17	Sandstone, very fine to fine-grained, light greenish gray, moderately friable, containing some biotite and muscovite and minute fragments of carbonized plant remains	444 - 461
13	Shale, greenish gray, silty, with considerable interbedded very fine-grained, light greenish gray sandstone, containing some muscovite and minute fragments of carbonized plant remains	461 - 474
19	Sandstone, very fine to fine-grained, light greenish gray, containing some muscovite and minute fragments of carbonized plant remains	474 - 493

Thickness Feet	Description of Strata	Depth in feet
23	Sandstone, fine-grained, light greenish gray, containing a little muscovite	493 - 516
17	Sandstone, fine-grained, light gray, almost white	516 - 533
8	Shale, dark gray, with some interbedded very fine-grained, greenish gray sandstone	533 - 541
9	Sandstone, fine-grained, light greenish gray, poorly sorted, containing some muscovite	541 - 550
7	Sandstone, very fine-grained, light greenish gray, with considerable interbedded dark gray shale	550 - 557
39	Shale, dark greenish gray, silty	557 - 596
22	Sandstone, very fine-grained, light greenish gray, containing some muscovite, with some interbedded dark gray shale	596 - 618
10	Siltstone, greenish gray, containing some muscovite, with considerable interbedded dark gray shale	618 - 628
7	Shale, greenish gray, sandy	628 - 635
33	Shale, dark gray, in part silty	635 - 668
15	Shale, greenish gray, sandy	668 - 683
20	Shale, dark gray, in part silty	683 - 703
5	Siltstone, greenish gray	703 - 708
18	Shale, dark gray	708 - 726
18	Sandstone, very fine-grained, light gray; Corry	726 - 744
10	Siltstone, light greenish gray, with considerable interbedded gray shale	744 - 754
29	Shale, dark gray, with considerable interbedded greenish gray siltstone	754 - 783
24	Shale, dark gray, with a little interbedded fine-grained, light gray sandstone	783 - 807

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, dark gray, with considerable interbedded light greenish gray siltstone	807 - 817
4	Shale, dark gray, with considerable interbedded very fine-grained, light greenish gray sandstone	817 - 821
	DEVONIAN SYSTEM, 4161 feet	
	Upper Devonian Series, 3661 feet	
	Conewango group, 409 feet	
20	Shale, dark purplish gray, with a great deal of interbedded dark greenish gray sandy and silty shale	821 - 841
30	Shale, dark purplish red, with considerable interbedded dark gray shale	841 - 871
32	Shale, dark purplish red, in part silty, with a little interbedded dark gray shale	871 - 903
9	Sandstone, very coarse-grained, light gray, almost white; Hundred-foot sand	903 - 912
7	Shale, greenish gray, sandy, with some interbedded dark gray shale and a little fine to medium-grained, light gray sandstone containing fragments of shells	912 - 919
23	Shale, dark reddish brown, in part silty, containing some muscovite, with a little interbedded greenish gray silty shale	919 - 942
8	Shale, dark gray, with considerable interbedded greenish gray siltstone	942 - 950
12	Shale, dark gray, with some interbedded dark purplish gray shale and greenish gray silty shale	950 - 962
6	Shale, dark gray	962 - 968
5	Sandstone, fine-grained, light gray, containing a few quartz grains to 2 millimeters in diameter	968 - 973
15	Shale, dark gray, with a little interbedded greenish gray siltstone and fine-grained, light gray sandstone	973 - 988

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
70	Shale, dark gray	988 - 1058
14	Shale, dark gray, with some interbedded greenish gray silty shale containing some muscovite	1058 - 1072
14	Shale, dark gray	1072 - 1086
16	Shale, dark purplish gray to red	1086 - 1102
16	Shale, dark gray, with some interbedded greenish gray silty shale and dark purplish gray to red silty shale	1102 - 1118
12	Shale, dark gray	1118 - 1130
14	Shale, dark gray, with a little interbedded very fine-grained, light gray sandstone containing occasional rounded milky quartz pebbles to 5 millimeters in diameter	1130 - 1144
49	Shale, dark gray	1144 - 1193
9	Shale, dark gray, silty, containing occasional fragments of shells	1193 - 1202
7	Shale, dark gray	1202 - 1209
14	Sandstone, very fine-grained, light gray, containing occasional rounded quartz grains to 2 millimeters in diameter, with a great deal of interbedded dark gray shale, in part silty	1209 - 1223
7	Sandstone, very fine-grained, light gray containing occasional quartz pebbles to 10 millimeters in diameter, with considerable interbedded dark gray shale	1223 - 1230
	Bottom of Conewango group	1230
25	Shale, dark gray	1230 - 1255
32	Shale, dark gray, with a little interbedded greenish gray silty shale	1255 - 1287
9	Siltstone, greenish gray, with considerable interbedded dark gray silty shale	1287 - 1296
12	Shale, dark gray, with a great deal of interbedded greenish gray silty shale	1296 - 1308

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
	Top of "pink rock"	1308
6	Sandstone, very fine-grained, light greenish gray, containing a little muscovite, with some interbedded dark purplish gray shale	1308 - 1314
10	Shale, dark gray, with considerable interbedded dark purplish gray shale, in part silty, containing some muscovite	1314 - 1324
7	Shale, dark purplish red	1324 - 1331
10	Shale, dark purplish gray, silty, with considerable interbedded greenish gray siltstone and some dark gray shale	1331 - 1341
8	Shale, dark gray, with considerable interbedded very fine-grained, light greenish gray sandstone, containing a little muscovite	1341 - 1349
18	Shale, dark purplish red	1349 - 1367
17	Shale, dark purplish red, with some interbedded dark gray shale and a little gray siltstone, containing fragments of shells	1367 - 1384
51	Shale, dark purplish gray, in part silty, containing fragments of shells, with some interbedded dark gray shale and gray siltstone	1384 - 1435
10	Shale, dark gray, with some interbedded greenish gray siltstone	1435 - 1445
64	Shale, dark gray, in part silty, with considerable interbedded dark purplish gray shale and a little gray siltstone, containing fragments of shells	1445 - 1509
23	Shale, dark purplish gray, in part silty, containing fragments of shells, with some interbedded dark gray shale	1509 - 1532
17	Shale, dark gray	1532 - 1549
19	Shale, dark greenish gray, silty, containing some muscovite and fragments of shells, with considerable interbedded dark gray shale	1549 - 1568

Thickness Feet	Description of Strata	Depth in feet
29	Shale, dark gray, in part silty	1568 - 1597
57	Shale, dark purplish gray, in part silty, containing fragments of shells, with a little interbedded greenish gray siltstone	1597 - 1654
15	Shale, dark greenish gray, sandy, containing some muscovite, with considerable interbedded dark purplish gray shale	1654 - 1669
11	Shale, dark gray, silty, with some interbedded dark purplish gray shale	1669 - 1680
	Bottom of "pink rock"	1680
40	Shale, greenish to dark greenish gray, silty, containing some muscovite and fragments of shells, with some interbedded dark gray shale	1680 - 1720
19	Sandstone, very fine-grained, light greenish gray, containing abundant fragments of shells, with considerable interbedded dark gray shale	1720 - 1739
7	Siltstone, light greenish gray, with a great deal of interbedded greenish gray silty shale	1739 - 1746
15	Sandstone, very fine-grained, light greenish gray, containing abundant fragments of shells, with some interbedded gray shale	1746 - 1761
34	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1761 - 1795
25	Shale, dark gray, with some interbedded greenish gray silty shale and light greenish gray siltstone	1795 - 1820
11	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1820 - 1831
19	Shale, gray to dark gray, with a great deal of interbedded greenish gray siltstone	1831 - 1850
29	Shale, greenish gray, silty, with some interbedded dark gray shale	1850 - 1879

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
37	Shale, dark gray, with some interbedded greenish gray silty shale, containing some biotite and muscovite	1879 - 1916
30	Shale, dark gray	1916 - 1946
76	Shale, dark gray, with some interbedded greenish gray silty shale	1946 - 2022
26	Shale, dark gray	2022 - 2048
12	Shale, dark gray, with a little interbedded grayish brown siltstone containing a little muscovite	2048 - 2060
14	Shale, dark gray	2060 - 2074
32	Shale, dark gray, with some interbedded gray, silty shale	2074 - 2106
108	Shale, gray to dark gray	2106 - 2214
46	Shale, gray to dark gray, with a little interbedded greenish gray siltstone	2214 - 2260
12	Shale, gray, with a little interbedded very fine-grained, grayish brown sandstone	2260 - 2272
47	Shale, gray to dark gray	2272 - 2319
15	Shale, gray to dark gray, with a little interbedded grayish brown siltstone	2319 - 2334
15	Shale, gray, with considerable interbedded very dark gray shale	2334 - 2349
12	Shale, gray to dark gray	2349 - 2361
44	Shale, gray, with some interbedded very dark gray shale	2361 - 2405
24	Shale, gray to dark gray	2405 - 2429
12	Shale, very dark gray, with considerable interbedded gray shale	2429 - 2441
41	Shale, dark gray	2441 - 2482
21	Shale, very dark gray, with considerable interbedded gray shale	2482 - 2503

Thickness Feet	Description of Strata	Depth in feet
113	Shale, gray to dark gray, containing minute pyrite pellets, with a little interbedded greenish gray silty shale and siltstone containing some muscovite	2503 - 2616
37	Shale, gray to dark gray, with considerable interbedded greenish gray, silty shale	2616 - 2653
8	Shale, dark gray	2653 - 2661
14	Shale, very dark gray, with some interbedded gray shale and greenish gray silty shale	2661 - 2675
88	Shale, gray to dark gray, with a little interbedded greenish gray silty shale	2675 - 2763
27	Shale, gray to dark gray, containing minute pyrite pellets	2763 - 2790
27	Shale, very dark gray, with some interbedded greenish gray silty shale	2790 - 2817
25	Shale, gray to dark gray, with some interbedded greenish gray silty shale	2817 - 2842
42	Shale, gray, with considerable interbedded very dark gray shale and some greenish gray silty shale	2842 - 2884
81	Shale, greenish gray, silty, with some interbedded dark gray shale	2884 - 2965
71	Shale, gray, containing minute pyrite pellets, with a little interbedded very dark gray shale	2965 - 3036
69	Shale, gray to dark gray, with a little interbedded gray silty shale	3036 - 3105
58	Shale, gray to dark gray, containing minute pyrite pellets, with a little interbedded greenish gray siltstone	3105 - 3163
187	Shale, gray to dark gray	3163 - 3350
50	Shale, grayish black, with some interbedded gray shale	3350 - 3400
15	Shale, gray, with a little interbedded greenish gray silty shale	3400 - 3415

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
22	Shale, dark gray, silty, with some interbedded gray shale	3415 - 3437
37	Shale, gray, with a little interbedded dark gray shale	3437 - 3474
25	Shale, gray, with a little interbedded greenish gray silty shale	3474 - 3499
60	Shale, dark gray, with a little interbedded very dark gray shale	3499 - 3559
14	Shale, dark gray, with some interbedded grayish black shale	3559 - 3573
27	Shale, gray to dark gray	3573 - 3600
57	Shale, dark gray, with some interbedded greenish gray, slightly calcareous, silty shale	3600 - 3657
10	Shale, greenish gray, silty, slightly calcareous, with considerable interbedded very dark gray shale	3657 - 3667
52	Shale, dark gray, with a little interbedded very dark gray shale	3667 - 3719
25	Shale, dark gray, with some interbedded greenish gray, slightly calcareous siltstone and a very little very dark gray shale	3719 - 3744
135	Shale, dark gray, with some interbedded grayish black shale and a little greenish gray, slightly calcareous siltstone	3744 - 3879
22	Shale, dark gray	3879 - 3901
14	Shale, dark gray, with some interbedded grayish black shale	3901 - 3915
92	Shale, gray to dark gray, with a little interbedded very dark gray shale	3915 - 4007
37	Shale, dark gray	4007 - 4044
65	Shale, dark gray, with a little interbedded grayish black shale	4044 - 4109
13	Shale, grayish black	4109 - 4122
10	Shale, very dark gray	4122 - 4132

Thickness Feet	Description of Strata	Depth in feet
73	Shale, grayish black, with some interbedded dark to very dark gray shale	4132 - 4205
86	Shale, grayish black	4205 - 4291
37	Shale, grayish black, with some interbedded very dark gray shale	4291 - 4328
35	Shale, grayish black, with considerable interbedded very dark gray shale	4328 - 4363
25	Shale, dark gray	4363 - 4388
10	Shale, very dark gray	4388 - 4398
20	Shale, grayish black, with some interbedded dark gray shale	4398 - 4418
8	Shale, very dark gray, with some interbedded dark gray shale	4418 - 4426
27	Shale, dark gray, with some interbedded grayish black shale	4426 - 4453
11	Shale, grayish black, slightly calcareous	4453 - 4464
9	Shale, very dark gray, silty and slightly calcareous	4464 - 4473
9	Shale, grayish black	4473 - 4482
	Middle Devonian Series, 346 feet	
	Tully limestone, 50 feet	
13	Limestone, very fine, dense, dark brownish gray, argillaceous, with a great deal of interbedded very dark gray, somewhat calcareous shale	4482 - 4495
20	Limestone, very fine, dense, brownish to dark brownish gray, argillaceous	4495 - 4515
17	Shale, very dark gray, calcareous, with some interbedded very fine, dense, brownish gray, argillaceous limestone	4515 - 4532
	Hamilton group, 170 feet	
8	Shale, grayish black, very calcareous	4532 - 4540

ockenberry No. 1

hickness Feet	Description of Strata	Depth in feet
55	Shale, dark gray, calcareous, with some interbedded very dark gray, slightly calcareous shale	4540 - 4595
5	Shale, grayish black, slightly calcareous	4595 - 4600
20	Shale, very dark gray, somewhat calcareous	4600 - 4620
19	Shale, very dark gray, slightly calcareous	4620 - 4639
21	Shale, very dark gray	4639 - 4660
19	Shale, grayish black	4660 - 4679
14	Shale, very dark gray, almost black, in part calcareous	4679 - 4693
19	Shale, very dark gray, almost black, very slightly calcareous, with considerable interbedded very fine, dense, dark brownish gray, argillaceous limestone, containing fragments of shells	4693 - 4702
	Onondaga limestone, 126 feet	
13	Limestone, very fine, dense, light brownish to brownish gray, argillaceous	4702 - 4715
22	Limestone, very fine, dense, light brownish to brownish gray, somewhat argillaceous, containing considerable light brownish to brownish gray, dense chert	4715 - 4737
13	Chert, dense, light brownish to brownish gray, with considerable interbedded very fine, dense, brownish gray, somewhat argillaceous limestone	4737 - 4750
12	Limestone, very fine, dense, brownish to dark brownish gray, somewhat argillaceous, containing occasional shell fragments and considerable light brownish to brownish gray, dense chert	4750 - 4762
10	Limestone, very fine, dense, grayish brown, silty, and slightly magnesian, containing considerable light brownish to brownish gray dense chert	4762 - 4772

Thickness Feet	Description of Strata	Depth in feet
20	Chert, dense, light gray, almost white, with considerable interbedded very fine, dense, grayish brown, somewhat magnesian limestone	4772 - 4792
19	Limestone, very fine, dense, grayish brown, somewhat silty, and magnesian, containing a great deal of light brownish to brownish gray, dense chert	4792 - 4811
9	Limestone, very fine, dense, brownish gray, containing considerable light brownish gray chert	4811 - 4820
8	Limestone, very fine, dense, dark brownish gray, slightly magnesian, containing considerable light brownish to brownish gray, dense chert	4820 - 4828
	Lower Devonian Series, 154 feet	
	Oriskany sandstone, 13 feet	
6	Sandstone, medium-grained, brownish gray, calcareous; some quartz grains are rounded and frosted and some possess secondary crystal facets	4828 - 4834
7	Sandstone, fine-grained, dark brownish gray, very calcareous; a few quartz grains are rounded and frosted and some possess secondary crystal facets	4834 - 4841
	Helderberg group, 141 feet	
31	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous, containing fragments of shells and a little brownish to dark brownish gray, dense chert	4841 - 4872
11	Limestone, very fine, dense, light brownish to brownish gray, containing a great deal light gray to brownish gray, dense chert, and abundant fragments of shells, with some interbedded very fine, dense, dark brownish gray, argillaceous limestone	4872 - 4883
27	Limestone, very fine, dense, dark brownish gray, argillaceous, with a little interbedded very fine, dense, limestone, containing light brownish to brownish gray chert and fragments of shells	4883 - 4910

hickness Feet	Description of Strata	Depth in feet
26	Limestone, very fine, crystalline, light to dark brownish gray, somewhat silty and argillaceous, containing fragments of shells	4910 - 4936
20	Limestone, very fine, dense, very dark brownish gray, containing fragments of shells	4936 - 4956
26	Limestone, very fine, dense, brownish to dark brownish gray, somewhat silty and argillaceous	4956 - 4982
	SILURIAN SYSTEM, 1651 feet	
	Upper Silurian or Cayugan Series, 953 feet	
	Cobleskill limestone, 13 feet	
13	Limestone, very fine, dense, light gray, argillaceous, and somewhat magnesian	4982 - 4995
	Salina group, 940 feet	
18	Limestone, very fine, dense, light brownish to brownish gray, argillaceous and magnesian, containing a little very fine, crystalline, white anhydrite	4995 - 5013
12	Limestone, very fine, dense, light to dark brownish gray, argillaceous and somewhat magnesian, containing a little light gray to brownish gray dense chert and a little very fine, crystalline, light gray anhydrite	5013 - 5025
78	Anhydrite, very fine, crystalline, brownish to dark brownish gray, with a great deal of interbedded very fine, dense, brownish to dark brownish gray, argillaceous and magnesian limestone	5025 - 5103
17	Dolomite, very fine, dense, slightly argillaceous, with considerable interbedded very fine, crystalline, light gray to brownish gray anhydrite	5103 - 5120
11	Dolomite, very fine, crystalline, slightly silty and argillaceous, with a little interbedded very fine, crystalline, brownish gray anhydrite	5120 - 5131

Thickness Feet	Description of Strata	Depth in feet
31	Limestone, very fine, dense, brownish gray, argillaceous and somewhat magnesian, with a little interbedded very fine crystalline, brownish gray anhydrite	5131 - 5162
86	Limestone, very fine, dense, dark to very dark grayish brown, argillaceous and dolomitic, with some interbedded very fine, crystalline, brownish gray anhydrite	5162 - 5248
8	Salt, coarse crystalline, colorless to light gray	5248 - 5256
25	Limestone, very fine, dense, grayish brown, argillaceous and magnesian, with a little interbedded anhydrite and salt	5256 - 5281
15	Salt, coarse crystalline, colorless to light gray	5281 - 5296
9	Limestone, very fine, dense, light grayish brown, argillaceous and magnesian, with some interbedded anhydrite and salt	5296 - 5305
17	Limestone, dark grayish brown, shaly and magnesian, with a little interbedded anhydrite	5305 - 5322
15	Limestone, very fine, dense, grayish brown, argillaceous and magnesian, with considerable interbedded very fine crystalline, light gray anhydrite and a little salt	5322 - 5337
13	Limestone, very dark grayish brown, shaly and magnesian	5337 - 5350
26	Limestone, very fine, dense, dark grayish brown, argillaceous and magnesian, with a little interbedded anhydrite and salt	5350 - 5376
12	Salt, medium, crystalline, light gray, with considerable interbedded very fine, dense, dark grayish brown argillaceous and magnesian limestone	5376 - 5388
20	Limestone, very fine, dense, dark grayish brown, argillaceous and somewhat magnesian, with some interbedded anhydrite and a little salt	5388 - 5408

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Limestone, very fine, dense, grayish brown, argillaceous and magnesian, with some interbedded anhydrite	5408 - 5422
18	Clay, light gray, somewhat dolomitic, with a little interbedded anhydrite	5422 - 5440
71	Limestone, very fine, dense, grayish brown, argillaceous and dolomitic, with some interbedded light gray, dolomitic clay and a little anhydrite and salt	5440 - 5511
27	Salt, medium crystalline, light gray, with considerable interbedded very fine, dense, grayish to dark grayish brown, argillaceous and magnesian limestone	5511 - 5538
38	Dolomite, very fine, dense, dark brownish gray, somewhat argillaceous, with a little interbedded anhydrite and salt	5538 - 5576
34	Limestone, very fine, dense, dark to very dark grayish brown, dolomitic and somewhat argillaceous, with a little interbedded anhydrite	5576 - 5610
30	Salt, coarse crystalline, colorless to light gray, with considerable interbedded very fine, dense, grayish to dark grayish brown argillaceous and magnesian limestone	5610 - 5640
14	Limestone, very fine, dense, dark grayish brown, argillaceous and magnesian, with some interbedded anhydrite	5640 - 5654
61	Limestone, very fine, dense, dark brownish gray, argillaceous and magnesian, with considerable interbedded light greenish gray claystone and a little anhydrite	5654 - 5715
26	Shale, light brownish and greenish gray, somewhat dolomitic, with a little interbedded anhydrite	5715 - 5741
22	Shale, gray, somewhat dolomitic, with a little interbedded dark brownish gray, shaly, magnesian limestone and anhydrite	5741 - 5763
8	Shale, dark brownish gray, somewhat dolomitic, with a little interbedded anhydrite	5763 - 5771

Thickness Feet	Description of Strata	Depth in feet
22	Shale, greenish gray to gray, slightly dolomitic, with some interbedded dark brownish gray, shaly, magnesian limestone and a little anhydrite	5771 - 5793
3	Salt, medium crystalline, colorless to light gray	5793 - 5796
44	Limestone, very fine, dense, dark brownish gray, argillaceous and magnesian, with some interbedded anhydrite and a little salt	5796 - 5840
10	Limestone, dark brownish gray, shaly and magnesian, with a little interbedded anhydrite	5840 - 5850
12	Limestone, very fine, dense, grayish brown, argillaceous and magnesian, with some interbedded greenish gray, somewhat dolomitic shale and salt, and a little anhydrite	5850 - 5862
18	Limestone, very fine, dense, grayish to very dark grayish brown, argillaceous and magnesian, with a little interbedded anhydrite and salt	5862 - 5880
23	Limestone, very fine, dense, very dark brownish gray, argillaceous and dolomitic, with a little interbedded anhydrite	5880 - 5903
32	Limestone, dark brownish gray, shaly and magnesian	5903 - 5935
	Middle Silurian or Niagaran Series, 518 feet	
	Lockport-Guelph group, 250 feet	
11	Limestone, very fine, crystalline, grayish to dark grayish brown, dolomitic and somewhat argillaceous	5935 - 5946
7	Limestone, very fine, crystalline, light grayish brown, dolomitic	5946 - 5953
55	Limestone, very fine, crystalline, light to dark grayish brown, dolomitic and somewhat argillaceous	5953 - 6008
62	Limestone, very fine, crystalline, brownish to dark brownish gray, dolomitic and argillaceous	6008 - 6070

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
55	Dolomite, very fine, crystalline, very dark brownish gray	6070 - 6125
19	Dolomite, very fine, crystalline, light brownish to dark brownish gray	6125 - 6144
11	Dolomite, very fine, crystalline, dark brownish gray, somewhat silty and argillaceous	6144 - 6155
5	Dolomite, very fine, crystalline, brownish gray	6155 - 6160
25	Dolomite, very fine, crystalline, dark to very dark brownish gray	6160 - 6185
	Clinton group, 268 feet	
37	Shale, dark gray, dolomitic, containing occasional fragments of shells	6185 - 6222
10	Limestone, very fine, crystalline, gray, silty and dolomitic	6222 - 6232
20	Shale, dark gray, dolomitic	6232 - 6254
20	Shale, gray, dolomitic, with a little interbedded gray siltstone	6254 - 6274
4	Siltstone, gray, somewhat dolomitic	6274 - 6278
60	Shale, dark gray, dolomitic, with some interbedded gray siltstone	6278 - 6338
35	Shale, greenish gray, with some interbedded dark gray shale and a little gray siltstone	6338 - 6373
17	Shale, greenish gray	6373 - 6390
21	Shale, greenish gray, with some interbedded light gray, slightly calcareous siltstone containing a little glauconite	6390 - 6411
24	Limestone, very fine, crystalline, light gray to gray, silty and argillaceous, containing a very little light gray, dense chert, with a great deal of interbedded greenish gray shale	6411 - 6435
3	Hematite, reddish brown, silty	6435 - 6438

Thickness Feet	Description of Strata	Depth in feet
4	Siltstone, dark greenish gray to reddish brown, with considerable interbedded dark greenish gray shale	6438 - 6442
3	Hematite, reddish brown, silty	6442 - 6445
8	Siltstone, gray, with considerable interbedded greenish gray shale	6445 - 6453
	Lower Silurian or Albion Series, 180 feet	
	Grimsby member, 68 feet	
20	Shale, brick red, silty	6453 - 6473
2	Sandstone, very fine-grained, reddish brown	6473 - 6475
17	Shale, brick red, silty, with a little interbedded very fine-grained, hard, light gray sandstone	6475 - 6492
9	Sandstone, very fine-grained, light gray to light pink, hard	6492 - 6501
2	Shale, reddish brown, sandy	6501 - 6503
5	Sandstone, very fine-grained, pink, hard	6503 - 6508
7	Sandstone, very fine-grained, light pink to pink, hard, with considerable interbedded reddish brown shale, in part sandy	6508 - 6515
6	Sandstone, very fine-grained, light gray to light pink, hard, with a little interbedded reddish brown, sandy shale	6515 - 6521
	Cabot Head and Manitoulin members, 103 feet	
5	Sandstone, very fine-grained, light gray, hard, with considerable interbedded greenish gray silty shale	6521 - 6526
3	Shale, dark gray, silty, containing muscovite, with considerable interbedded very fine-grained, light gray, almost white, hard sandstone	6526 - 6529
6	Sandstone, very fine-grained, light gray, hard, with considerable interbedded silty shale containing muscovite	6529 - 6535

ockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, greenish gray, silty, with considerable interbedded very fine-grained, light gray, hard sandstone	6535 - 6541
11	Sandstone, very fine-grained, light gray, hard, with some interbedded greenish gray, silty shale	6541 - 6552
3	Sandstone, very fine-grained, light gray, hard	6552 - 6555
2	Shale, greenish gray, silty	6555 - 6557
3	Sandstone, very fine-grained, light reddish brown	6557 - 6560
11	Sandstone, very fine-grained, light greenish gray, with some interbedded gray shale and a little greenish gray, sandy shale	6560 - 6571
10	Sandstone, very fine-grained, light gray, hard, with considerable interbedded greenish gray sandy shale and some gray shale	6571 - 6581
2	Sandstone, very fine-grained, light gray, hard	6581 - 6583
41	Shale, dark gray, with some interbedded light gray to gray siltstone	6583 - 6624
	Whirlpool sandstone, 9 feet	
9	Sandstone, very fine-grained, light gray, with considerable interbedded dark gray shale	6624 - 6633
	ORDOVICIAN SYSTEM, 3107 feet	
	Upper Ordovician or Cincinnatian series, 2179 feet	
	Queenston shale, 1067 feet	
6	Shale, greenish gray	6633 - 6639
62	Shale, dark brick red	6639 - 6701
24	Shale, brick red, sandy	6701 - 6725
42	Shale, dark brick red, silty	6725 - 6767
243	Shale, brick red, silty	6767 - 7010

Thickness Feet	Description of Strata	Depth in feet
13	Shale, brick red, sandy	7010 - 7023
55	Shale, brick red, silty	7023 - 7078
22	Shale, brick red, silty, with a little interbedded light grayish green, somewhat calcareous siltstone	7078 - 7100
18	Shale, brick red, silty	7100 - 7118
14	Shale, brick red, sandy	7118 - 7132
21	Shale, brick red, silty	7132 - 7153
193	Shale, brick red, sandy, somewhat calcareous	7153 - 7346
9	Shale, brick red, sandy, with some interbedded brick red shale and some grayish green siltstone	7346 - 7355
136	Shale, brick red, sandy	7355 - 7491
6	Sandstone, very fine-grained, brick red, argillaceous and slightly calcareous, containing some muscovite	7491 - 7497
28	Shale, brick red, sandy, with some interbedded brick red shale	7497 - 7525
17	Shale, reddish brown, sandy	7525 - 7542
10	Shale, brick red, with considerable interbedded very fine-grained, light greenish gray sandstone	7542 - 7552
11	Shale, brick red, with some interbedded light greenish gray, silty shale	7552 - 7563
11	Siltstone, light greenish gray, with some interbedded brick red, silty shale	7563 - 7574
10	Shale, light greenish gray, silty, with some interbedded brick-red shale	7574 - 7584
17	Siltstone, light greenish gray, with some interbedded light greenish gray silty shale and some brick red silty shale	7584 - 7601
12	Siltstone, light greenish gray, with some interbedded light greenish gray, silty shale	7601 - 7613

Thickness Feet	Description of Strata	Depth in feet
11	Siltstone, light greenish gray, with some interbedded lignt greenish gray silty shale and some brick red silty shale	7613 - 7624
14	Shale, reddish brown, with a little interbedded light greenish gray, somewhat calcareous, silty shale	7624 - 7638
12	Shale, reddish brown	7638 - 7650
33	Shale, light greenish gray, with considerable interbedded reddish brown shale and a little light greenish gray, slightly calcareous siltstone	7650 - 7683
17	Shale, greenish gray, with some interbedded reddish brown shale	7683 - 7700
	Reedsville shale, 810 feet	
25	Shale, greenish gray	7700 - 7725
104	Shale, greenish gray, with a little interbedded, greenish gray, somewhat calcareous siltstone containing occasional fragments of shells	7725 - 7829
221	Shale, gray, with a little interbedded gray, somewhat calcareous siltstone, containing fragments of shells	7829 - 8050
53	Shale, gray to dark gray, with a little interbedded gray, somewhat calcareous siltstone, containing fragments of shells	8050 - 8103
54	Shale, gray to dark gray, with some interbedded gray, somewhat calcareous siltstone, containing fragments of shells	8103 - 8157
128	Shale, dark gray, with a little interbedded gray, somewhat calcareous siltstone, containing fragments of shells	8157 - 8285
219	Shale, dark gray, with a little interbedded gray, somewhat calcareous siltstone	8285 - 8504
6	Shale, very dark gray, in part silty	8504 - 8510
	Utica shale, 302 feet	
122	Shale, grayish black; gas pockets, 8510-8598	8510 - 8632

Thickness Feet	Description of Strata	Depth in feet
48	Shale, grayish black, somewhat calcareous, containing fragments of shells	8632 - 8680
132	Shale, grayish black, calcareous, containing fragments of shells in lower part	8680 - 8812
	Middle Ordovician or Champlainian Series, 741 feet	
	Top of Trenton limestone	8812
22	Limestone, very fine, dense, very dark gray, almost black, slightly magnesian, containing abundant fragments of shells, with some interbedded grayish black, calcareous shale	8812 - 8834
14	Limestone, very fine, crystalline, dark brownish gray, somewhat silty and argillaceous and slightly magnesian, containing abundant fragments of shells and a little black dense chert, with some interbedded grayish black, calcareous shale	8834 - 8848
18	Limestone, very fine, crystalline, dark brownish gray, silty and argillaceous, slightly magnesian, containing abundant fragments of shells and a little brownish gray dense chert, with some interbedded dark gray, somewhat calcareous shale	8848 - 8866
12	Limestone, dark gray, shaly, with considerable interbedded very fine, crystalline, dark brownish gray, argillaceous limestone, containing abundant fragments of shells	8866 - 8878
14	Limestone, very fine, crystalline, brownish gray, argillaceous, with considerable interbedded dark gray, shaly limestone.	8878 - 8892
19	Limestone, dark to very dark gray, shaly, with considerable interbedded very fine, crystalline, dark brownish gray, argillaceous limestone containing abundant fragments of shells	8892 - 8911
39	Limestone, very fine, dense, dark brownish gray, argillaceous and slightly magnesian, containing abundant fragments of shells, with some interbedded very dark gray, somewhat calcareous shale	8911 - 8950

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
32	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous and slightly magnesian, containing fragments of shells	8950 - 8982
12	Shale, very dark gray, calcareous, with some interbedded very fine, dense, dark brownish gray, argillaceous and slightly magnesian limestone and a very little light gray bentonite	8982 - 8994
17	Limestone, very fine, dense, dark brownish gray, somewhat argillaceous and slightly magnesian, containing abundant fragments of shells	8994 - 9011
9	Limestone, very fine, dense, very dark brownish gray, somewhat argillaceous and slightly magnesian, containing fragments of shells, with a little interbedded light gray bentonite	9011 - 9020
14	Limestone, very fine, dense, very dark brownish gray, somewhat argillaceous, containing fragments of shells	9020 - 9034
16	Limestone, very fine, dense, light gray to gray, slightly magnesian	9034 - 9050
55	Limestone, very fine, dense, dark brownish gray, somewhat argillaceous and slightly magnesian	9050 - 9105
21	Limestone, very fine, dense, light gray to brownish gray, somewhat argillaceous and slightly magnesian	9105 - 9126
83	Limestone, very fine, dense, dark brownish gray, slightly magnesian	9126 - 9209
16	Limestone, very fine, crystalline, light to dark brownish gray, slightly magnesian	9209 - 9225
46	Limestone, very fine, dense, brownish to dark brownish gray, slightly magnesian, containing occasional fragments of shells	9225 - 9271
117	Limestone, very fine, dense, dark to very dark brownish gray, slightly argillaceous and magnesian	9271 - 9388

Thickness Feet	Description of Strata	Depth in feet
40	Limestone, very fine, dense, gray, argillaceous, with some interbedded dark brownish gray calcareous shale	9388 - 9428
11	Limestone, very fine, dense, brownish to dark brownish gray, somewhat argillaceous and magnesian	9428 - 9439
11	Limestone, very fine, crystalline, brownish gray, somewhat magnesian	9439 - 9450
48	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous and somewhat magnesian	9450 - 9498
7	Limestone, very fine, oolitic, dark brownish gray, argillaceous and somewhat magnesian	9498 - 9505
30	Limestone, very fine, dense, dark brownish gray, argillaceous and somewhat magnesian, with some interbedded gray to dark gray, somewhat calcareous shale, SHOW OF GAS, 9505-9510	9505 - 9535
13	Limestone, very fine, dense, light gray to gray, argillaceous and dolomitic	9535 - 9548
5	Shale, very dark brownish gray, calcareous, with some interbedded very fine, dense, gray argillaceous and dolomitic limestone	9548 - 9553
	Lower Ordovician or Canadian Series, 187 feet	
	Lower Beekmantown dolomite, 187 feet	
5	Dolomite, fine, crystalline, light brownish gray, containing some light gray dense chert	9553 - 9558
2	Dolomite, fine, crystalline, light brownish gray, containing some light gray dense chert and a few subrounded to rounded, frosted quartz grains	9558 - 9560
20	Dolomite, fine to medium crystalline, light brownish gray	9560 - 9580
14	Dolomite, fine to medium crystalline, light brownish gray, containing a little light gray dense chert	9580 - 9594

ockenberry No. 1

hickness Feet	Description of Strata	Depth in feet
68	Dolomite, fine to medium crystalline, light gray to light brownish gray	9594 - 9662
78	Dolomite, fine, crystalline, light brownish gray, containing occasional small drusy cavities lined with minute dolomite crystals	9662 - 9740
	CAMBRIAN SYSTEM, 356+ feet	
	Upper Cambrian Series, 356+ feet	
	Gatesburg formation, 356+ feet	
6	Dolomite, fine, crystalline, mottled light brownish gray and black	9740 - 9746
13	Dolomite, very fine to fine, crystalline, light brownish gray, slightly silty	9746 - 9759
24	Dolomite, very fine to fine crystalline, light gray, containing a few rounded and frosted quartz grains, SHOW OF GAS, 9746-9771, acidized without results	9759 - 9783
32	Dolomite, very fine, crystalline, light brownish gray, somewhat siliceous, containing some rounded and frosted quartz grains	9783 - 9815
56	Dolomite, fine crystalline, light brownish gray, containing a little fine quartz silt and sand; larger quartz grains rounded and frosted	9815 - 9871
4	Dolomite, fine, crystalline, brownish gray, somewhat siliceous, containing some very fine to fine quartz grains, the larger ones of which are rounded and frosted	9871 - 9875
15	Dolomite, fine, crystalline, brownish gray, containing considerable light gray oolitic chert, with individual siliceous oolites up to one and one-fourth millimeter in diameter	9875 - 9890
16	Dolomite, very fine to fine crystalline, brownish gray, slightly argillaceous, containing some quartz silt and very fine sand with most of larger quartz grains rounded and frosted	9890 - 9906

Hockenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
57	Dolomite, very fine, crystalline, light brownish gray, containing a little white chert and some quartz silt and fine sand, with larger quartz grains rounded and frosted	9906 - 9963
85	Dolomite, fine to medium crystalline, light brownish gray	9963 - 10048
21	Limestone, fine crystalline, mottled light and dark gray, dolomitic, silty and sandy, with larger quartz grains rounded and frosted	10048 - 10069
5	Limestone, fine, crystalline, light brownish gray, dolomitic and sandy, with many of the quartz grains rounded and frosted	10069 - 10074
3	Sandstone, fine to medium-grained, light gray, quartzose, dolomitic; many of the quartz grains are rounded and frosted	10074 - 10077
7	Sandstone, fine-grained, light brownish gray, quartzose, very dolomitic; many of the quartz grains are rounded and frosted	10077 - 10084
4	Sandstone, fine-grained, light gray, quartzose, slightly dolomitic; many of the quartz grains are rounded and frosted	10084 - 10088
8	Sandstone, fine to medium-grained, white; mostly angular quartz grains with some rounded and frosted; one bailer of SALT WATER per hour at 10092 feet	10088 - 10096
	TOTAL DEPTH	10096

WELL-SAMPLE RECORD

NO.

5

WELL-SAMPLE RECORD

SPETZ NO. 1 WELL
POTTER DEVELOPMENT COMPANY

Warren County, Pa., Pittsfield Township
Youngsville Quadrangle: 2.86 miles south of 41° 55' N. Lat. and 1.68 miles east of 79° 30' W. Long.
Completed: May 8, 1937.
Elevation: 1849 feet above sea level.
Total Depth: 5165 feet
Deepest formation: Queenston
Result: No sandstone encountered at Oriskany horizon, black salt water at 4690 to 4714 in Lockport, dry in Albion.
Samples: 100 to 4737 and 5028 to 5133 examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 100+ feet	
100	No samples	0 - 100
	DEVONIAN SYSTEM, 3818 feet	
	Upper Devonian Series, 3371 feet	
	Conewango group, 460 feet	
	Approximate top of Conewango group	100
14	Shale, greenish-gray, sandy and micaceous, with a little interbedded dark greenish-gray shale	100 - 114
9	Shale, dark greenish-gray, with considerable interbedded greenish-gray siltstone containing some muscovite	114 - 123
27	Siltstone, greenish-gray, containing abundant fragments of shells, with considerable interbedded dark-gray shale	123 - 150
10	Shale, greenish-gray, in part silty, with considerable interbedded greenish-gray siltstone containing occasional fragments of shells	150 - 160

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Siltstone, greenish-gray, containing a little muscovite, with some interbedded greenish-gray shale	160 - 165
10	Shale, greenish-gray, silty, with some interbedded dark-gray shale and some greenish-gray siltstone	165 - 175
5	Siltstone, greenish-gray, with some interbedded dark greenish-gray shale	175 - 180
12	Shale, greenish-gray, silty, with some interbedded very fine grained light greenish-gray sandstone and some greenish-gray siltstone	180 - 192
6	Siltstone, greenish-gray, containing fragments of shells, with some interbedded greenish-gray silty shale	192 - 198
79	Shale, greenish-gray, sandy, and micaceous, with some interbedded very fine grained light greenish-gray micaceous sandstone, in part slightly calcareous	198 - 277
6	Shale, greenish-gray, sandy and micaceous, with some interbedded light greenish-gray siltstone containing an occasional shell fragment	277 - 283
6	Sandstone, very fine grained, light greenish-gray, somewhat calcareous	283 - 289
11	Shale, greenish-gray, silty, with some interbedded dark-gray shale and some very fine grained light greenish-gray slightly calcareous sandstone	289 - 300
12	Sandstone, coarse-grained, light-gray, containing some milky quartz grains to 6 mm. in diameter, Venango First sand	300 - 312
20	Shale, greenish-gray, silty, with some interbedded greenish-gray siltstone and a little coarse-grained light-gray sandstone	312 - 332
12	Siltstone, greenish-gray, with some interbedded coarse-grained light-gray sandstone and some greenish-gray silty shale	332 - 344

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Shale, greenish-gray, silty, with a little interbedded greenish-gray siltstone and a little coarse-grained light-gray sandstone	344 - 358
18	Shale, dark-gray, with some interbedded greenish-gray silty shale and a little coarse-grained light-gray sandstone	358 - 376
24	Shale, dark greenish gray, with some interbedded greenish-gray silty shale	376 - 400
18	Shale, greenish-gray, in part silty, with a little interbedded very fine grained light greenish-gray sandstone	400 - 418
11	Shale, greenish-gray, silty, with considerable interbedded very fine grained greenish-gray sandstone containing muscovite	418 - 429
11	Sandstone, very fine grained, light gray, in part slightly calcareous, with a little interbedded gray shale	429 - 440
33	Shale, greenish- to dark greenish-gray, silty	440 - 473
19	Shale, greenish-gray, sandy and micaceous, containing fragments of shells	473 - 492
8	Shale, dark greenish-gray, sandy, with a little interbedded fine-grained light-gray sandstone containing occasional well-rounded quartz grains to 3 mm. in diameter	492 - 500
10	Sandstone, fine-grained, light gray, containing a few well-rounded quartz grains to 3 mm. in diameter, with some interbedded greenish-gray shale	500 - 510
28	Shale, dark greenish-gray, in part sandy, with some interbedded fine-grained light-gray sandstone containing occasional well-rounded quartz grains to 3 mm. in diameter	510 - 538
18	Shale, dark greenish-gray, with a little interbedded coarse-grained light-gray sandstone containing some quartz pebbles to 8 mm. in diameter	538 - 556
4	Shale, dark greenish-gray, with considerable interbedded coarse-grained light-gray sandstone containing some flat quartz pebbles to 10 mm. in diameter	556 - 560

Thickness Feet	Description of Strata	Depth in feet
	Conneaut group, 676 feet	
61	Shale, dark greenish-gray, in part silty	560 - 621
49	Shale, greenish-gray, silty, containing fragments of shells, with a great deal of interbedded dark-gray shale	621 - 670
	Top of "pink rock"	670
20	Shale, dark purplish-gray, silty, with some interbedded dark greenish-gray silty shale	670 - 690
80	Shale, dark purplish-gray, in part silty, with considerable interbedded dark greenish-gray silty shale containing fragments of shells	690 - 770
21	Shale, dark purplish-gray, in part silty, with considerable interbedded greenish-gray siltstone containing fragments of shells	770 - 791
4	Shale, greenish-gray, sandy, containing abundant fragments of shells, with some interbedded dark purplish-gray shale	791 - 795
5	Shale, dark purplish-gray, with a little interbedded greenish-gray siltstone	795 - 800
20	Shale, dark greenish-gray, silty, containing abundant fragments of shells, with considerable interbedded dark purplish-gray silty shale containing fragments of shells	800 - 820
54	Shale, dark purplish-gray, in part silty, with some interbedded dark greenish-gray silty shale	820 - 874
12	Shale, dark purplish-gray, in part silty, with some interbedded greenish-gray silty shale and a little greenish-gray siltstone containing fragments of shells	874 - 886
44	Shale, greenish-gray, silty, with a great deal of interbedded dark purplish-gray silty shale containing fragments of shells	886 - 930
8	Shale, greenish-gray, silty, with some interbedded dark purplish-gray shale and some greenish-gray siltstone containing fragments of shells	930 - 938

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, greenish-gray, silty, containing fragments of shells, with a great deal of interbedded dark purplish-gray shale, in part silty	938 - 946
16	Shale, greenish-gray, silty, with a little interbedded dark-gray shale	946 - 962
70	Shale, greenish-gray, silty, with some interbedded dark purplish-gray, silty shale and a little greenish-gray siltstone containing fragments of shells	962 - 1030
5	Shale, greenish-gray, silty, with a great deal of interbedded light greenish-gray somewhat calcareous siltstone and a little dark purplish-gray shale	1030 - 1035
	Bottom of "pink rock"	1035
23	Shale, greenish-gray, in part silty	1035 - 1058
69	Shale, greenish-gray, silty, with some interbedded light greenish-gray siltstone	1058 - 1127
13	Siltstone, light greenish-gray, slightly calcareous, containing some muscovite, with a little interbedded greenish-gray shale	1127 - 1140
22	Shale, greenish-gray, silty, with a little interbedded light greenish-gray, slightly calcareous siltstone	1140 - 1162
13	Siltstone, light greenish-gray, slightly calcareous, with some interbedded greenish-gray shale	1162 - 1175
21	Shale, greenish-gray, silty, with considerable interbedded light greenish-gray slightly calcareous siltstone	1175 - 1196
34	Shale, greenish-gray, in part silty, with a little interbedded light greenish-gray slightly calcareous siltstone	1196 - 1230
6	Sandstone, very fine grained, light greenish-gray, slightly calcareous, containing some biotite and muscovite, with some interbedded greenish-gray silty shale, Glade sand	1230 - 1236
	Bottom of Conneaut group	1236

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
3	Siltstone, light greenish-gray, slightly calcareous	1236 - 1239
19	Shale, greenish-gray, in part silty	1239 - 1258
72	Siltstone, light greenish-gray, slightly calcareous, containing an occasional shell fragment, with considerable interbedded greenish-gray silty shale	1258 - 1330
6	Sandstone, very fine grained, light greenish-gray, slightly calcareous and containing a little muscovite, with some interbedded greenish-gray silty shale, Clarendon sand	1330 - 1336
24	Siltstone, light greenish-gray, containing a little muscovite and biotite, with considerable interbedded greenish-gray silty shale	1336 - 1360
12	Shale, greenish-gray, silty, containing abundant fragments of shells	1360 - 1372
48	Shale, greenish-gray, with some interbedded greenish-gray, slightly calcareous siltstone	1372 - 1420
4	Siltstone, greenish-gray, slightly calcareous, containing some biotite and muscovite	1420 - 1424
31	Shale, greenish-gray, with some interbedded greenish-gray siltstone	1424 - 1455
5	Siltstone, greenish-gray, containing some biotite and muscovite	1455 - 1460
89	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1460 - 1549
24	Shale, greenish-gray, in part silty	1549 - 1573
42	Siltstone, light greenish-gray, slightly calcareous, with some interbedded greenish-gray shale	1573 - 1615
53	Siltstone, greenish-gray, somewhat calcareous, with considerable interbedded dark-gray shale	1615 - 1668
32	Shale, dark-gray, with some interbedded greenish-gray shale and siltstone	1668 - 1700

ickness Feet	Description of Strata	Depth in feet
45	Shale, dark-gray, with considerable interbedded greenish-gray slightly calcareous silty shale	1700 - 1745
34	Shale, very dark gray, with some interbedded greenish-gray shale	1745 - 1779
54	Shale, dark-gray, with some interbedded greenish-gray silty shale and slightly calcareous siltstone	1779 - 1833
37	Shale, dark-gray, with considerable interbedded greenish-gray slightly calcareous silty shale	1833 - 1870
28	Shale, dark-gray, with a little interbedded greenish-gray somewhat calcareous siltstone containing occasional fragments of shells	1870 - 1898
7	Shale, dark-gray	1898 - 1905
77	Shale, dark-gray, with a little interbedded greenish-gray slightly calcareous siltstone	1905 - 1982
66	Shale, dark to very dark gray, with a little interbedded greenish-gray siltstone	1982 - 2048
14	Shale, very dark gray, silty, with considerable interbedded greenish-gray silty shale	2048 - 2062
33	Shale, greenish-gray, with some interbedded greenish-gray and very dark gray silty shale	2062 - 2095
5	Shale, greenish-gray, in part silty, with some interbedded greenish-gray siltstone and a little grayish-black silty shale	2095 - 2100
20	Shale, greenish-gray, in part silty, with considerable interbedded very dark gray silty shale	2100 - 2120
15	Shale, dark-gray, with some interbedded greenish-gray silty shale	2120 - 2135
7	Shale, dark-gray, with a little interbedded grayish-black shale and greenis siltstone	2135 - 2142
42	Shale, dark to very dark gray, with some interbedded greenish-gray silty shale	2142 - 2184

Thickness Feet	Description of Strata	Depth in feet
41	Shale, greenish-gray, silty, with some interbedded dark-gray silty shale	2184 - 2225
27	Shale, greenish-gray, silty, with some interbedded dark-gray silty shale and a little greenish-gray siltstone	2225 - 2252
38	Shale, greenish-gray, silty, with considerable interbedded dark-gray silty shale	2252 - 2290
9	Shale, greenish-gray, with considerable interbedded greenish-gray slightly calcareous sandy shale	2290 - 2299
116	Shale, greenish-gray, silty, with some interbedded dark-gray shale and greenish-gray slightly calcareous siltstone	2299 - 2415
45	Shale, gray	2415 - 2460
70	Shale, gray, with some interbedded greenish-gray silty shale and a little greenish-gray siltstone	2460 - 2530
16	Shale, gray, with considerable interbedded grayish-black shale and a little greenish-gray silty shale	2530 - 2546
14	Shale, gray, with some interbedded grayish-black shale	2546 - 2560
22	Shale, gray, with some interbedded greenish-gray silty shale and some very dark gray shale	2560 - 2582
16	Shale, gray, with some interbedded greenish-gray silty shale and some grayish-black silty shale	2582 - 2598
6	Shale, grayish-black, with some interbedded gray shale and some greenish-gray sandy shale	2598 - 2604
71	Shale, grayish-black, with considerable interbedded gray shale and a little greenish-gray sandy shale	2604 - 2675
5	Shale, gray, with considerable interbedded grayish-black shale and some greenish-gray silty shale	2675 - 2680

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Shale, grayish-black, with some interbedded gray shale and some greenish-gray silty shale	2680 - 2695
7	Shale, gray, with considerable interbedded grayish-black shale	2695 - 2702
8	Shale, grayish-black, with considerable interbedded gray shale	2702 - 2710
9	Shale, greenish-gray, silty, with considerable interbedded grayish-black shale and some gray shale	2710 - 2719
9	Shale, grayish-black, with considerable interbedded dark brownish-gray silty shale and some gray shale	2719 - 2728
7	Shale, dark-gray, silty, with some interbedded greenish-gray silty shale and a little grayish-black shale	2728 - 2735
27	Shale, greenish-gray, slightly calcareous and silty, with some interbedded gray shale and some very dark gray shale	2735 - 2762
6	Shale, greenish-gray, silty, with some interbedded grayish-black silty shale and some gray shale	2762 - 2768
13	Shale, dark to very dark gray, with considerable interbedded greenish-gray silty shale	2768 - 2781
8	Shale, gray, with considerable interbedded grayish-black shale	2781 - 2789
91	Shale, dark greenish-gray, silty and slightly calcareous	2789 - 2880
15	Shale, dark greenish-gray, silty, containing fragments of shells with some interbedded very dark gray shale	2880 - 2895
10	Shale, greenish-gray, silty and slightly calcareous, with some interbedded grayish-black shale	2895 - 2905
25	Shale, dark-gray, with some interbedded grayish-black shale and a little greenish-gray siltstone	2905 - 2930

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, dark-gray, with some interbedded greenish-gray, slightly calcareous silty shale	2930 - 2938
62	Shale, dark-gray, slightly calcareous, and in part silty, with a little interbedded grayish-black shale	2938 - 3000
88	Shale, grayish-black, with considerable interbedded dark greenish-gray slightly calcareous silty shale	3000 - 3088
37	Shale, dark-gray, with considerable interbedded grayish-black shale	3088 - 3125
83	Shale, grayish-black, silty, with some interbedded dark-gray silty shale	3125 - 3208
207	Shale, grayish-black, in part silty	3208 - 3415
50	Shale, grayish-black, with some interbedded very dark gray shale, in part finely laminated	3415 - 3465
6	Shale, grayish-black	3465 - 3471
	Middle Devonian Series, 436 feet	
	Hamilton group, 281 feet	
59	Limestone, very fine, dense, dark brownish-gray, argillaceous	3471 - 3530
15	Limestone, very dark brownish-gray, shaly	3530 - 3545
40	Shale, very dark gray, calcareous	3545 - 3585
21	Shale, very dark gray, somewhat calcareous, with a little interbedded very fine, dense, light- to dark brownish-gray argillaceous limestone	3585 - 3606
20	Limestone, very fine, dense, light brownish- to brownish-gray containing tripolitic chert and a little light brownish- to brownish-gray chalcedonic chert	3606 - 3626
26	Shale, dark-gray, calcareous	3626 - 3652
64	Shale, grayish-black, with some interbedded very dark gray calcareous shale	3652 - 3716

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black shale and a little very fine, dense, brownish-gray limestone	3716 - 3733
19	Shale, grayish-black, with some interbedded very dark gray somewhat calcareous shale and a little very fine, dense, brownish-gray limestone	3733 - 3752
	Onondaga limestone, 155 feet	
31	Limestone, very fine, dense, grayish-brown, containing considerable brownish-gray subchalcedonic chert	3752 - 3783
22	Limestone, very fine, dense, grayish-brown, somewhat argillaceous, containing a great deal of light brownish-gray subchalcedonic chert	3783 - 3805
30	Limestone, very fine, dense, dark brownish-gray, somewhat argillaceous, containing considerable light brownish-gray subchalcedonic chert	3805 - 3835
31	Limestone, very fine, dense, grayish-brown, containing a great deal of light brownish-gray subchalcedonic chert	3835 - 3866
9	Limestone, very fine, dense, grayish-brown, slightly argillaceous, containing considerable light brownish-gray subchalcedonic chert	3866 - 3875
8	Limestone, very fine, dense, grayish brown, containing considerable light brownish-gray subchalcedonic chert and a little tripolitic chert with micro-fossil molds	3875 - 3883
15	Chert, light brownish- to brownish-gray, subchalcedonic, with some associated light-gray to gray calcareous tripolitic chert	3883 - 3898
5	Chert, light brownish- to brownish-gray, subchalcedonic, containing some interbedded minute grains of glauconite, with some associated gray somewhat calcareous tripolitic chert	3898 - 3903

Thickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, dense, dark brownish-gray, silty, containing considerable light-gray subchalcedonic chert, some glauconite, and some medium-sized rounded and frosted quartz grains	3903 - 3907
	Lower Devonian Series, 11 feet	
	Oriskany formation, 11 feet	
3	Limestone, very fine, dense, grayish-brown, somewhat silty and sandy, containing some medium-sized rounded and frosted quartz grains	3907 - 3910
8	Limestone, very fine, dense, grayish-brown, slightly silty and sandy	3910 - 3918
	SILURIAN SYSTEM, 1219 feet	
	Upper Silurian or Cayugan Series, 737 feet	
	Cobleskill limestone, 45 feet	
17	Limestone, very fine, crystalline, light grayish-brown, somewhat magnesian	3918 - 3935
5	Limestone, very fine, dense, brownish-gray, somewhat argillaceous and magnesian	3935 - 3940
23	Limestone, very fine, crystalline, grayish- to dark grayish-brown, magnesian and somewhat argillaceous	3940 - 3963
	Salina group, 692 feet	
5	Limestone, very fine, dense, very dark grayish brown, argillaceous and somewhat magnesian, containing a little anhydrite	3963 - 3968
42	Limestone, very fine, dense, dark to very dark grayish-brown, argillaceous and dolomitic, containing a great deal of anhydrite	3968 - 4010
26	Limestone, gray, shaly, with some interbedded very fine, dense, dark grayish-brown argillaceous and dolomitic limestone containing a little anhydrite	4010 - 4036
104	Limestone, very fine, dense, dark grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	4036 - 4140

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
32	Limestone, very fine, crystalline, light-brown to grayish-brown, somewhat argillaceous, dolomitic, containing considerable anhydrite	4140 - 4172
26	Limestone, brownish-gray, shaly, dolomitic, containing some anhydrite	4172 - 4198
21	Limestone, very fine, crystalline, brown, dolomitic, containing a little anhydrite	4198 - 4219
44	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing some anhydrite	4219 - 4263
14	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	4263 - 4277
23	Salt, coarse, crystalline, colorless to light-gray	4277 - 4300
5	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing a little anhydrite	4300 - 4305
15	Salt, coarse, crystalline, colorless to light-gray, with a great deal of interbedded very fine, dense, grayish-brown, argillaceous dolomitic limestone containing some anhydrite	4305 - 4320
28	Anhydrite, very fine, crystalline, grayish-brown, with a great deal of interbedded very fine, dense, grayish-brown argillaceous limestone	4320 - 4348
17	Limestone, very fine, dense, grayish-brown, argillaceous, containing some anhydrite, with some interbedded greenish-gray somewhat calcareous clay and some dark-gray shale	4348 - 4365
10	Anhydrite, very fine, crystalline, light grayish-brown, with some interbedded very fine, dense, grayish-brown argillaceous limestone and a little very dark gray shale	4365 - 4375
5	Shale, gray, with considerable interbedded anhydrite and some very fine, dense, light brownish-gray argillaceous limestone	4375 - 4380

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Clay, greenish-gray, slightly calcareous, with some interbedded very fine, dense, brownish-gray argillaceous limestone and some very dark-gray shale	4380 - 4397
18	Clay, greenish-gray, somewhat calcareous, containing some anhydrite and large salt crystals	4397 - 4415
20	Limestone, dark brownish-gray, shaly, containing some anhydrite	4415 - 4435
33	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	4435 - 4468
47	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing some anhydrite, with a little interbedded greenish-gray clay and grayish-black shale	4468 - 4515
15	Limestone, very fine, dense, platy, very dark grayish-brown, argillaceous and dolomitic, containing some anhydrite	4515 - 4530
7	Shale, dark greenish gray, somewhat calcareous, with some interbedded very fine, dense, brownish-gray, argillaceous dolomitic limestone containing a little anhydrite	4530 - 4537
11	Limestone, very fine, dense, very dark brownish-gray, argillaceous and dolomitic, containing some anhydrite, with some interbedded dark-gray slightly calcareous shale	4537 - 4548
12	Shale, dark greenish and brownish-gray, dolomitic	4548 - 4560
15	Limestone, very fine, dense, very dark brownish-gray, argillaceous and dolomitic, containing a little anhydrite	4560 - 4575
11	Limestone, very fine, crystalline, dark grayish-brown, somewhat argillaceous, dolomitic, containing some anhydrite	4575 - 4586
4	Limestone, very fine, dense, dark brownish-gray, somewhat argillaceous, dolomitic	4586 - 4590
24	Limestone, very fine, crystalline, dark grayish brown, somewhat argillaceous, dolomitic	4590 - 4614

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Limestone, very fine, dense, dark grayish-brown, argillaceous and dolomitic	4614 - 4626
29	Limestone, very fine, crystalline, very dark grayish-brown, somewhat argillaceous, dolomitic	4626 - 4655
	Middle Silurian or Niagaran Series, 306 feet	
	Top of Lockport-Guelph dolomite	4655
35	Dolomite, very fine, crystalline, dark grayish-brown	4655 - 4690
24	Dolomite, fine, crystalline, dark grayish-brown, black SALT WATER,	4690 - 4714
23	Dolomite, very fine, crystalline, dark grayish-brown	4714 - 4737
291	No samples	4737 - 5028
	From drillers' log	
168	Lime	4737 - 4905
40	Shale	4905 - 4945
16	Lime	4945 - 4961
	Lower Silurian or Albion Series, 176 feet	
	Grimsby member, 82 feet	
67	Sand	4961 - 5028
	From sample examination	
15	Sandstone, very fine to fine-grained, pink	5028 - 5043
	Cabot Head and Manitoulin members, 83 feet	
5	Shale, gray, with considerable interbedded very fine grained light-gray sandstone	5043 - 5048
20	Shale, dark gray, with considerable interbedded very fine grained light-gray sandstone	5048 - 5068
24	Sandstone, very fine grained, light-gray, with some interbedded greenish-gray, in part silty and sandy shale	5068 - 5092

Spetz No. 1

Thickness Feet	Description of Strata	Depth in feet
34	Shale, dark-gray, with considerable interbedded dark greenish-gray very slightly calcareous siltstone	5092 - 5126
	Whirlpool sandstone, 11 feet	
3	Sandstone, very fine grained, light gray, with considerable interbedded grayish-green sandstone	5126 - 5129
4	Sandstone, very fine grained, light gray, with considerable dark-gray shale	5129 - 5133
32	No samples	5133 - 5165
	From drillers' log	
4	Hard white sand	5133 - 5137
	ORDOVICIAN SYSTEM, 28+ feet	
	Upper Ordovician or Cincinnatian Series, 28+ feet	
	Queenston shale, 28+ feet	
28	Red shale	5137 - 5165
	TOTAL DEPTH	5165

WELL-SAMPLE RECORD

NO.

6

WELL-SAMPLE RECORD

CHARLES ERICKSON NO. 1 WELL
C. E. UPDEGRAFF ET AL.

Warren County, Pa., Elk Township, Warrant 5542
Warren Quadrangle: 1.01 miles north of 41° 55' N. Lat. and 1.46 miles west of 79° 00' W. Long.
Completed: September 5, 1938.
Elevation: 1926 feet above sea level.
Total depth: 5630 feet
Result: Show of gas, 5145-5148 feet and black salt water, 5148-5150 feet in Lockport; show of gas, 5431-5433 feet, in Albion Series.
Samples: 420 to 4415 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
420	No samples	0 - 420
	From drillers' log	
	Pleistocene, 88 feet	
6	Top soil	0 - 6
82	Sand and gravel	6 - 88
	DEVONIAN SYSTEM, 4169+ feet	
	Upper Devonian Series, 3672+ feet	
87	Shale, blue	88 - 175
8	Shell	175 - 183
25	Shale, blue	183 - 208
5	Sand	208 - 213
7	Shale, blue	213 - 220
10	Sand, coarse	220 - 230
5	Shale, light	230 - 235
5	Sand, fine, white	235 - 240

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
13	Sand, coarse, dark	240 - 253
7	Sand, coarse, light	253 - 260
10	Sand, fine, light	260 - 270
9	Sand, white, fine, hard	270 - 279
6	Shale	279 - 285
120	Sand, dark coarse, SHOW OF GAS	285 - 405
15	Shale, dark	405 - 420
	Well-sample record	
18	Shale, gray with some interbedded greenish-gray siltstone and some greenish-gray sandy shale	420 - 438
26	Shale, dark greenish gray	438 - 464
8	Shale, dark gray	464 - 472
13	Shale, dark greenish gray, sandy	472 - 485
13	Shale, dark greenish gray, containing occasional fragments of shells, with a little interbedded dark purplish-gray shale	485 - 498
42	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	498 - 540
	Top of "pink rock"	540
10	Shale, dark gray, with considerable interbedded dark purplish gray shale	540 - 550
58	Shale, dark purplish gray, in part sandy, containing a little muscovite, with some interbedded dark greenish-gray sandy shale containing fragments of shells and a little muscovite	550 - 608
17	Shale, dark purplish gray, in part sandy, containing occasional fragments of shells	608 - 625
9	Shale, dark greenish gray, sandy, containing occasional fragments of shells, with some interbedded dark gray shale	625 - 634

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Shale, dark greenish gray, in part sandy, with considerable interbedded dark purplish-gray shale containing occasional fragments of shells	634 - 645
12	Shale, dark gray, with some interbedded dark purplish-gray shale and some greenish-gray siltstone containing occasional fragments of shells	645 - 657
12	Siltstone, greenish gray, containing fragments of shells, with considerable interbedded dark gray shale	657 - 669
21	Shale, greenish gray, sandy, containing fragments of shells, with some interbedded dark gray shale	669 - 690
20	Shale, dark purplish gray, with some interbedded greenish-gray siltstone containing fragments of shells	690 - 710
36	Shale, dark greenish gray, sandy, containing fragments of shells, with considerable interbedded dark purplish gray shale	710 - 746
7	Siltstone, greenish gray, containing fragments of shells	746 - 753
51	Shale, dark purplish gray, in part sandy, with some interbedded dark greenish-gray sandy shale containing occasional fragments of shells	753 - 804
21	Shale, dark purplish gray, in part sandy, with some interbedded gray to dark gray shale	804 - 825
21	Shale, dark purplish gray, in part sandy, with some interbedded dark greenish-gray sandy shale	825 - 846
24	Shale, dark purplish gray, with a great deal of interbedded greenish-gray siltstone containing fragments of shells	846 - 870
10	Shale, greenish gray, with some interbedded dark purplish-red shale and a little dark purplish-red, fine-grained sandstone with hematite bond and containing microfossils	870 - 880

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
	Bottom of "pink rock"	880
32	Shale, greenish gray	880 - 912
8	Shale, dark greenish gray, with some interbedded greenish-gray siltstone	912 - 920
21	Shale, greenish gray	920 - 941
11	Siltstone, greenish gray, with some interbedded greenish-gray shale	941 - 952
26	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	952 - 978
12	Shale, greenish gray, sandy, with some interbedded greenish-gray shale	978 - 990
34	Shale, dark greenish gray	990 - 1024
29	Shale, dark gray	1024 - 1053
12	Siltstone, greenish gray, containing abundant fragments of shells, with some interbedded dark gray siltstone	1053 - 1065
6	Shale, greenish gray, sandy, containing fragments of shells, with some interbedded dark gray shale	1065 - 1071
9	Shale, greenish gray, sandy, containing abundant fragments of shells, with considerable interbedded dark purplish-gray shale	1071 - 1080
28	Siltstone, light greenish gray, containing abundant fragments of shells, with some interbedded greenish-gray sandy shale and some dark gray shale	1080 - 1108
77	Shale, dark gray, with some interbedded light gray siltstone containing some muscovite and biotite	1108 - 1185
	Top of Glade sand	1185
12	Sandstone, very fine-grained, light greenish gray, with a great deal of interbedded dark gray shale	1185 - 1197

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Sandstone, very fine-grained, light greenish gray, with considerable interbedded dark gray shale	1197 - 1208
10	Sandstone, very fine-grained, light greenish gray, with some interbedded dark gray shale, smell of OIL at 1185-1218	1208 - 1218
	Bottom of Glade sand and Conneaut group	1218
24	Shale, dark gray	1218 - 1242
13	Siltstone, light greenish gray, with considerable interbedded dark gray shale	1242 - 1255
22	Sandstone, very fine-grained, light greenish gray, containing a little muscovite, with some interbedded dark gray shale, Clarendon	1255 - 1277
15	Siltstone, light greenish gray, with considerable interbedded dark gray shale	1277 - 1292
10	Shale, greenish gray, sandy, containing occasional fragments of shells with some interbedded dark gray shale	1292 - 1302
20	Siltstone, light greenish gray, containing a little muscovite and biotite, with considerable interbedded dark gray shale	1302 - 1322
59	Shale, greenish gray, sandy, containing occasional fragments of shells, with some interbedded dark gray shale	1322 - 1381
23	Shale, dark gray, with some interbedded light greenish gray siltstone	1381 - 1404
9	Siltstone, light greenish gray, with considerable interbedded dark gray shale	1404 - 1413
31	Shale, dark gray, with a little interbedded light greenish-gray siltstone	1413 - 1444
14	Siltstone, light greenish gray, slightly calcareous, with some interbedded dark gray shale	1444 - 1458
27	Shale, dark gray, with considerable interbedded greenish gray siltstone containing fragments of shells	1458 - 1485

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
55	Shale, dark gray	1485 - 1540
64	Shale, gray, with some interbedded greenish gray siltstone	1540 - 1604
54	Shale, dark gray, with considerable interbedded greenish-gray siltstone containing fragments of shells	1604 - 1658
12	Sandstone, very fine-grained, light gray, slightly calcareous, containing a little biotite and muscovite, with a great deal of interbedded dark gray shale	1658 - 1670
41	Shale, gray to dark gray, with a little interbedded gray siltstone	1670 - 1711
16	Siltstone, light greenish gray, slightly calcareous, containing some muscovite and biotite, with considerable interbedded gray shale	1711 - 1727
12	Sandstone, very fine-grained, light greenish gray, slightly calcareous containing a little biotite, with a great deal of interbedded gray shale	1727 - 1739
66	Shale, gray, with some interbedded very fine-grained, light gray, slightly calcareous sandstone	1739 - 1805
23	Shale, greenish gray, sandy with considerable interbedded gray to dark gray shale	1805 - 1828
27	Siltstone, greenish gray, with a great deal of interbedded dark to very dark gray shale	1828 - 1855
22	Siltstone, light greenish gray, somewhat calcareous, with considerable interbedded gray to dark gray shale	1855 - 1877
76	Shale, gray to dark gray, with some interbedded greenish-gray, slightly calcareous siltstone	1877 - 1953
97	Shale, gray, with some interbedded light greenish-gray, slightly calcareous siltstone	1953 - 2050

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
43	Shale, gray to dark gray, with some interbedded greenish-gray, slightly calcareous siltstone	2050 - 2093
22	Shale, gray to dark gray	2093 - 2115
72	Shale, gray to dark gray, with some interbedded greenish-gray siltstone	2115 - 2187
62	Shale, dark gray, with considerable interbedded greenish-gray siltstone, a little GAS at 2210 feet	2187 - 2249
34	Shale, dark gray, with some interbedded light greenish-gray siltstone	2249 - 2283
87	Shale, dark gray, with some interbedded greenish gray siltstone	2283 - 2370
28	Siltstone, greenish gray, slightly calcareous, with considerable interbedded dark gray shale	2370 - 2398
10	Shale, dark to very dark gray, with some interbedded greenish-gray siltstone	2398 - 2408
12	Shale, dark gray	2408 - 2420
12	Shale, dark gray, with considerable interbedded grayish-black shale	2420 - 2432
15	Siltstone, gray, with some interbedded dark gray, sandy shale	2432 - 2447
11	Siltstone, gray, with considerable interbedded very dark gray shale	2447 - 2458
11	Shale, gray to dark gray, with some interbedded greenish-gray siltstone	2458 - 2469
	Top of Dunkirk shale	2469
21	Shale, grayish black, with considerable interbedded dark gray, sandy shale	2469 - 2490
18	Shale, greenish gray, sandy, with some interbedded dark gray shale	2490 - 2508
23	Shale, dark to very dark gray, with some interbedded greenish-gray siltstone	2508 - 2531

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
56	Shale, black, with a little interbedded gray shale	2531 - 2587
	Bottom of Dunkirk shale and Canadaway group	2587
10	Shale, greenish gray, sandy	2587 - 2597
23	Shale, dark gray	2597 - 2620
10	Shale, greenish gray, sandy, slightly calcareous, with considerable interbedded dark gray shale	2620 - 2630
38	Siltstone, greenish gray, somewhat calcareous, contains some muscovite	2630 - 2668
22	Siltstone, greenish gray, slightly calcareous, with considerable interbedded gray to dark gray shale	2668 - 2690
13	Shale, greenish gray, sandy	2690 - 2703
34	Siltstone, greenish gray, with some interbedded gray shale	2703 - 2737
10	Shale, grayish black	2737 - 2747
83	Shale, greenish gray, sandy and slightly calcareous, with some interbedded gray shale	2747 - 2830
14	Shale, greenish gray, sandy, with considerable interbedded grayish black shale	2830 - 2844
42	Shale, greenish gray, sandy, with some interbedded dark gray to grayish black shale	2844 - 2886
24	Shale, dark to very dark gray, with some interbedded greenish-gray sandy shale	2886 - 2910
25	Siltstone, greenish gray, with considerable interbedded very dark gray to grayish black shale	2910 - 2935
66	Siltstone, greenish gray, containing some muscovite, with some interbedded dark gray shale	2935 - 3001
20	Shale, gray, with some interbedded very dark gray shale	3001 - 3021

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
34	Shale, dark gray, with some interbedded greenish gray siltstone	3021 - 3055
10	Shale, dark to very dark gray	3055 - 3065
25	Siltstone, greenish gray, with a great deal of interbedded dark gray shale	3065 - 3090
15	Siltstone, greenish gray, with some interbedded dark gray shale, smell of OIL at 3096	3090 - 3105
13	Siltstone, greenish gray, with a great deal of interbedded very dark gray to grayish-black shale	3105 - 3118
42	Shale, dark to very dark gray	3118 - 3160
68	Shale, grayish black	3160 - 3228
22	Shale, dark gray, with some interbedded greenish-gray slightly calcareous siltstone	3228 - 3250
19	Shale, dark gray	3250 - 3269
11	Shale, grayish black	3269 - 3280
93	Shale, black, containing some pyrite	3280 - 3373
36	Shale, grayish black	3373 - 3409
49	Shale, grayish black, with some interbedded gray shale	3409 - 3458
9	Shale, dark gray	3458 - 3467
13	Shale, grayish black, with some interbedded very dark gray shale	3467 - 3480
65	Shale, grayish black	3480 - 3545
38	Shale, very dark gray, very slightly calcalcareous	3545 - 3583
17	Shale, dark gray, very slightly calcareous	3583 - 3600
32	Shale, very dark gray, very slightly calcareous, with a little interbedded grayish black shale	3600 - 3632
50	Shale, grayish black	3632 - 3682

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Shale, very dark gray, very slightly calcareous	3682 - 3712
26	Shale, grayish black with some interbedded very dark brownish gray, somewhat calcareous shale	3712 - 3738
14	Shale, dark gray, slightly calcareous	3738 - 3752
8	Shale, very dark gray, somewhat calcareous	3752 - 3760
	Middle Devonian Series, 437 feet	
	Hamilton group, 344 feet	
3	Limestone, very fine, dense, brownish gray, argillaceous	3760 - 3763
27	Shale, very dark brownish gray, somewhat calcareous	3763 - 3790
7	Shale, very dark brownish gray, somewhat calcareous, with considerable interbedded very fine, dense brownish gray, somewhat argillaceous limestone	3790 - 3797
11	Limestone, very fine, dense, light grayish to grayish brown, argillaceous limestone, with some interbedded very dark brownish-gray, somewhat calcareous shale	3797 - 3808
8	Limestone, very fine, dense, light brownish gray, argillaceous, containing a little light grayish-brown dense chert	3808 - 3816
14	Limestone, very fine, dense, brownish to dark brownish gray, argillaceous, containing some light grayish-brown dense chert	3816 - 3830
50	Shale, dark gray, calcareous	3830 - 3880
62	Shale, very dark gray, somewhat calcareous	3880 - 3942
20	Shale, grayish black, calcareous	3942 - 3962
18	Shale, very dark gray, calcareous	3962 - 3980
22	Shale, brownish black, calcareous	3980 - 4002
46	Shale, brownish black, somewhat calcareous	4002 - 4048

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Shale, brownish black, somewhat calcareous, with a little interbedded very fine, dense, brownish to dark brownish-gray limestone	4048 - 4062
42	Shale, black, GAS pockets 4074-4083	4062 - 4104
	Onondaga limestone, 93 feet	
32	Limestone, very fine, dense, very dark grayish brown, argillaceous, containing considerable dark brownish-gray dense chert	4104 - 4136
20	Limestone, very fine, crystalline, brownish gray, containing a great deal of light brownish gray dense chert	4136 - 4156
26	Chert, dense, light brownish gray, with some interbedded very fine, crystalline, brownish-gray limestone	4156 - 4182
6	Limestone, very fine, dense, brownish gray, containing considerable light brownish-gray dense chert	4182 - 4186
11	Limestone, very fine, dense, grayish to dark grayish brown, argillaceous and siliceous, with a little glauconite in lower part	4186 - 4197
	Lower Devonian series, 60 feet	
	Oriskany sandstone, 2 feet	
2	Sandstone, fine to medium-grained, light gray, some of quartz grains rounded and frosted	4197 - 4199
	Helderberg limestone, 58 feet	
41	Limestone, very fine, dense, grayish to dark grayish brown, slightly argillaceous and magnesian	4199 - 4240
5	Limestone, very fine, crystalline, dark grayish brown, slightly argillaceous and somewhat magnesian	4240 - 4245
12	Limestone, very fine, dense, dark to very dark grayish brown, slightly argillaceous and magnesian	4245 - 4257

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 1288 feet	
	Upper Silurian or Cayugan Series, 725 feet	
	Cobleskill limestone, 30 feet	
6	Limestone, very fine, dense, light grayish to grayish brown, dolomitic and somewhat argillaceous	4257 - 4263
9	Limestone, very fine, dense, dark to very dark brownish gray, dolomitic and somewhat argillaceous	4263 - 4272
15	Limestone, very fine, dense, very dark brownish gray, argillaceous and somewhat magnesian, containing fragments of shells	4272 - 4287
	Salina group, 695 feet	
128	Limestone, very fine, dense, dark to very dark grayish brown, argillaceous, containing considerable interbedded very fine, crystalline, light brownish-gray anhydrite	4287 - 4415
1215	No samples	4415 - 5630
	From drillers' log	
175	Lime, brown	4415 - 4590
10	Lime, brown, soft	4590 - 4600
15	Salt	4600 - 4615
5	Lime, shell	4615 - 4620
10	Salt	4620 - 4630
5	Lime, brown	4630 - 4635
20	Shale, brown	4635 - 4655
6	Shale, gray	4655 - 4661
169	Shale, blue, caving	4661 - 4830
6	Lime, brown	4830 - 4836
16	Shale, brown, soft	4836 - 4852

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Traces of salt	4852 - 4864
36	Lime, brown and shale	4864 - 4900
10	Shale, brown	4900 - 4910
9	Lime, brown, hard	4910 - 4919
6	Lime, dark gray	4919 - 4925
25	Lime, gray	4925 - 4950
18	Shale, gray and lime	4950 - 4968
14	Lime, gray	4968 - 4982
	Middle Silurian or Niagaran Series, 426 feet	
	Lockport-Guelph dolomite, 264 feet	
35	Lime, brown, hard	4982 - 5017
24	Lime, brown	5017 - 5041
51	Lime, gray	5041 - 5092
22	Lime, dark	5092 - 5114
18	Lime, black	5114 - 5132
13	Lime, lighter	5132 - 5145
3	Lime, SHOW OF GAS	5145 - 5148
2	Lime, black SALT WATER	5148 - 5150
6	Shale	5150 - 5156
9	Shale, caving	5156 - 5165
5	Lime	5165 - 5170
33	Lime, gray	5170 - 5203
11	Shale	5203 - 5214
21	Lime	5214 - 5235
11	Lime, hard	5235 - 5246

Erickson No. 1

Thickness Feet	Description of Strata	Depth in feet
	Clinton group, 162 feet	
14	Shale, sandy	5246 - 5260
38	Shale, sandy, dark	5260 - 5298
60	Shale, sandy	5298 - 5358
12	Shale and shells	5358 - 5370
24	Shale, soft	5370 - 5394
14	Lime and shale	5394 - 5408
	Lower Silurian or Albion Series, 137 feet	
11	Shale, "Red Medina", hard	5408 - 5419
13	Sand, SHOW OF GAS, 5431-5433	5419 - 5432
16	Sand, gray, hard	5432 - 5448
33	Sand, hard	5448 - 5481
14	Sand	5481 - 5495
12	Sand, white	5495 - 5507
4	Sand, dark	5507 - 5511
9	Sand	5511 - 5520
10	Sand, very hard	5520 - 5530
7	Sand	5530 - 5537
8	Shale, gray	5537 - 5545
	ORDOVICIAN SYSTEM, 85+ feet	
	Upper Ordovician or Cincinnatian Series, 85+ feet	
	Queenston shale, 85+ feet	
5	Shale, reddish	5545 - 5550
13	Shale	5550 - 5563
18	Shale, red and shells	5563 - 5581
13	Shale, red, sandy	5581 - 5594
31	Shale, red	5594 - 5625
5	Shale, hard	5625 - 5630
	TOTAL DEPTH	5630

WELL-SAMPLE RECORD

NO.

7

WELL-SAMPLE RECORD

LESSOR AND LAUNER NO. 1 WELL
POTTER DEVELOPMENT COMPANY

Warren County, Pa., Kinzua Township, Lot 42.
Warren Quadrangle: 2.07 miles south of 41° 50' N. Lat. and 0.48 mile west of 79° 00' W. Long.
Completed: March 8, 1937.
Elevation: 1994 feet above sea level.
Total depth: 4928 feet.
Deepest formation: Salina.
Result: 100,000 cubic feet of gas and 3 barrels of salt water per day at 4712-4715 feet from Oriskany. Flow increased to 116,000 cubic feet after shot. Well abandoned as a dry hole.
Samples: 35 to 4928 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 225+ feet	
	Pocono group, 225+ feet	
35	No samples	0 - 35
6	Sandstone, fine- to medium-grained, light-gray, stained reddish-brown by weathering	35 - 41
11	Siltstone, greenish-gray, with a little interbedded gray shale	41 - 52
20	Sandstone, coarse, conglomeratic, light-gray, with occasional flat quartz pebbles up to 8 mm. in diameter	52 - 72
25	Shale, dark greenish-gray	72 - 97
10	Shale, greenish-gray, sandy	97 - 107
5	Shale, greenish-gray, sandy, with some interbedded dark greenish-gray shale	107 - 112
5	Shale, greenish-gray, sandy, with a little interbedded coarse light-gray sandstone	112 - 117
8	Shale, gray	117 - 125

Thickness Feet	Description of Strata	Depth in feet
	Knapp formation, 100 feet	
4	Sandstone, coarse, conglomeratic, light-gray, with occasional flat quartz pebbles up to 8 mm. in diameter	125 - 129
4	Shale, greenish-gray, sandy	129 - 133
9	Sandstone, very fine, light-gray	133 - 142
49	Shale, greenish- to dark greenish-gray, in part sandy	142 - 191
4	Sandstone, coarse, conglomeratic, light-gray, with flat quartz pebbles up to 8 mm. in diameter	191 - 195
10	Shale, dark-gray	195 - 205
10	Sandstone, fine, light greenish-gray, with a little muscovite and an occasional quartz grain up to 3 mm. in diameter	205 - 215
10	Sandstone, coarse, light-gray, slightly calcareous, with occasional quartz grains up to 3 mm. in diameter	215 - 225
	DEVONIAN SYSTEM, 4553 feet	
	Upper Devonian Series, 4171 feet	
	Conewango group, 505 feet	
	Oswayo formation, 235 feet	
90	Shale, dark-gray	225 - 315
5	Shale, greenish-gray, sandy	315 - 320
23	Shale, dark-gray, with considerable interbedded greenish-gray siltstone	320 - 343
5	Shale, greenish-gray, sandy	343 - 348
8	Sandstone, very fine grained, light greenish-gray, containing minute fragments of plant remains	348 - 356
34	Shale, dark-gray, with some interbedded very fine grained light greenish-gray sandstone	356 - 390
16	Shale, dark-gray	390 - 406

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
4	Shale, greenish-gray, sandy	406 - 410
44	Shale, dark-gray, with considerable interbedded very fine grained light greenish-gray sandstone	410 - 454
6	Sandstone, very fine grained, greenish-gray, calcareous, containing abundant fragments of shells	454 - 460
	Cattaraugus formation, 270 feet	
20	Shale, brick-red, with a little interbedded greenish-gray shale and siltstone	460 - 480
31	Shale, greenish-gray, sandy, with some interbedded brick-red shale	480 - 511
4	Shale, brick-red	511 - 515
11	Shale, greenish-gray, sandy, with considerable interbedded brick-red shale	515 - 526
20	Sandstone, very fine grained, light greenish-gray, with considerable interbedded greenish- to dark greenish-gray shale	526 - 546
4	Shale, dark-gray	546 - 550
13	Shale, brick-red	550 - 563
5	Sandstone, fine-grained, light greenish-gray	563 - 568
3	Shale, brick-red, sandy	568 - 571
14	Shale, greenish- to dark greenish-gray, sandy, containing minute fragments of plant remains	571 - 585
10	Sandstone, very fine grained, light greenish-gray, somewhat calcareous, with some interbedded greenish-gray shale and siltstone	585 - 595
25	Shale, dark greenish-gray	595 - 620
15	Shale, greenish-gray, sandy	620 - 635
8	Sandstone, very fine grained, light greenish-gray	635 - 643

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
50	Shale, dark greenish-gray	643 - 693
29	Shale, greenish-gray	693 - 722
8	Shale, dark purplish-red	722 - 730
	Conneaut group, 702 feet	
15	Siltstone, greenish-gray, with a great deal of interbedded dark greenish-gray shale	730 - 745
10	Shale, dark greenish-gray, sandy	745 - 755
76	Shale, dark greenish-gray	755 - 831
7	Shale, dark-gray, with a little interbedded greenish-gray siltstone	831 - 838
	Top of "pink rock"	838
72	Shale, dark purplish-gray, in part sandy, containing abundant fragments of shells, with some interbedded dark greenish-gray sandy shale	838 - 910
40	Shale, dark greenish-gray, sandy, with a little interbedded greenish-gray siltstone containing fragments of shells	910 - 950
20	Shale, dark purplish-gray, with considerable interbedded dark greenish-gray sandy shale	950 - 970
15	Shale, dark greenish-gray, sandy, with some interbedded light greenish-gray siltstone containing abundant fragments of shells	970 - 985
5	Shale, dark purplish gray	985 - 990
19	Shale, dark greenish-gray, in part sandy, with some interbedded light greenish-gray siltstone containing abundant fragments of shells	990 - 1009
31	Shale, dark purplish-gray, in part sandy, with some interbedded dark greenish-gray shale and some greenish-gray siltstone containing abundant fragments of shells	1009 - 1040
20	Shale, dark greenish-gray, sandy, with a little interbedded greenish-gray siltstone containing fragments of shells	1040 - 1060

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
70	Shale, dark purplish-gray, in part sandy, with considerable interbedded dark greenish-gray shale	1060 - 1130
35	Shale, dark purplish-gray, with some interbedded dark-gray shale	1130 - 1165
9	Shale, dark-gray, with a little interbedded light greenish-gray siltstone containing fragments of shells	1165 - 1174
7	Shale, dark purplish-gray, with some interbedded greenish-gray sandy shale	1174 - 1181
	Bottom of "pink rock"	1181
36	Shale, dark-gray, with considerable interbedded greenish-gray siltstone containing occasional fragments of shells	1181 - 1217
38	Shale, dark-gray, with considerable interbedded dark greenish-gray sandy shale	1217 - 1255
7	Shale, gray	1255 - 1262
11	Shale, gray, with considerable interbedded light greenish-gray siltstone containing fragments of shells	1262 - 1273
7	Shale, gray, with a little interbedded fine-grained light gray moderately hard sandstone	1273 - 1280
52	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	1280 - 1332
8	Shale, greenish-gray, sandy, with some interbedded dark-gray shale	1332 - 1340
8	Shale, dark-gray, with a little interbedded greenish-gray siltstone	1340 - 1348
41	Shale, dark greenish-gray with considerable interbedded dark-gray shale	1348 - 1389
43	Siltstone, greenish-gray, containing abundant fragments of shells, with some interbedded dark-gray shale	1389 - 1432
	Bottom of Conneaut group	1432

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
28	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	1432 - 1460
48	Shale, dark-gray, with some interbedded light greenish-to greenish-gray siltstone containing occasional fragments of shells	1460 - 1508
18	Shale, dark gray, with some interbedded gray sandy shale	1508 - 1526
	Top of Clarendon sand	1526
1	Sandstone, fine- to medium-grained, light gray, containing a few quartz grains up to 3 mm. in diameter	1526 - 1527
10	Sandstone, very fine grained, light greenish-gray, containing a little muscovite and a few quartz grains up to one-half mm. in diameter, moderately friable, with some interbedded dark-gray shale	1527 - 1537
6	Sandstone, very fine grained, light greenish gray, containing a little muscovite and a few quartz grains up to one-half mm. in diameter, moderately friable	1537 - 1543
	Bottom of Clarendon sand	1543
13	Shale, greenish-gray, with considerable interbedded light greenish-gray siltstone	1543 - 1556
43	Shale, greenish-gray, with a little interbedded light greenish-gray siltstone	1556 - 1599
6	Sandstone, very fine grained, light greenish-gray, containing a little muscovite, Gartland sand	1599 - 1605
28	Shale, dark-gray	1605 - 1633
16	Shale, dark-gray, with considerable interbedded light greenish-gray siltstone	1633 - 1649
16	Shale, gray to dark-gray	1649 - 1665
12	Shale, dark greenish-gray, with a little interbedded fine-grained gray hard sandstone	1665 - 1677
8	Shale, dark greenish-gray, with some interbedded dark brownish-gray sandy shale	1677 - 1685

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
22	Shale, dark greenish-gray, sandy, with some interbedded dark-gray shale	1685 - 1707
7	Shale, dark-gray, with considerable interbedded greenish-gray siltstone	1707 - 1714
54	Shale, gray	1714 - 1768
16	Shale, gray, with considerable interbedded greenish-gray sandy shale	1768 - 1784
24	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1784 - 1808
28	Shale, dark-gray, with some interbedded greenish-gray siltstone	1808 - 1836
11	Siltstone, greenish-gray, slightly calcareous, with some interbedded dark-gray shale	1836 - 1847
77	Shale, dark-gray, with a little interbedded greenish-gray siltstone containing occasional fragments of shells	1847 - 1924
23	Shale, gray	1924 - 1947
85	Shale, gray, with considerable interbedded light greenish-gray siltstone	1947 - 2032
23	Shale, gray	2032 - 2055
7	Shale, dark-gray	2055 - 2062
23	Shale, dark-gray, with some interbedded light brownish and greenish-gray siltstone	2062 - 2085
30	Shale, gray	2085 - 2115
67	Shale, gray to dark-gray, with a little interbedded light greenish-gray slightly calcareous siltstone	2115 - 2182
30	Shale, gray to dark-gray	2182 - 2212
32	Shale, dark-gray, with some interbedded greenish-gray slightly calcareous siltstone	2212 - 2244
25	Shale, gray	2244 - 2269
48	Shale, dark-gray, with a little interbedded greenish-gray siltstone	2269 - 2317

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
28	Shale, gray	2317 - 2345
32	[illegible] dark-gray	2345 - 2377
28	Shale, [illegible]	2377 - 2405
25	Shale, gray, with a little interbedded greenish-gray slightly calcareous siltstone	2405 - 2430
54	Shale, gray to dark-gray	2430 - 2484
26	Shale, dark-gray, with a little interbedded greenish-gray siltstone	2484 - 2510
140	Shale, gray	2510 - 2650
110	Shale, gray, with a little interbedded greenish-gray siltstone	2650 - 2760
87	Shale, gray to dark-gray	2760 - 2847
13	Shale, very dark gray, almost black, with some interbedded dark-gray shale	2847 - 2860
30	Shale, very dark gray, almost black	2860 - 2890
13	Shale, gray, in part sandy	2890 - 2903
32	Shale, gray	2903 - 2935
30	Shale, gray, with some interbedded dark-gray shale	2935 - 2965
17	Shale, grayish-black, with some interbedded dark-gray shale	2965 - 2982
20	Siltstone, greenish-gray, containing occasional fragments of shells, with some interbedded dark-gray shale	2982 - 3002
7	Shale, gray	3002 - 3009
6	Shale, grayish-black	3009 - 3015
20	Shale, greenish-gray, sandy, with considerable interbedded dark-gray shale	3015 - 3035
18	Siltstone, greenish-gray, somewhat calcareous, with considerable interbedded dark-gray shale	3035 - 3053

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
31	Shale, dark greenish-gray, sandy, with some interbedded dark-gray shale	3053 - 3084
52	Shale, gray, with some interbedded light greenish-gray siltstone	3084 - 3136
18	Shale, dark-gray, with a little interbedded light-greenish gray slightly calcareous siltstone	3136 - 3154
23	Shale, grayish-black, with considerable interbedded gray slightly calcareous sandy shale	3154 - 3177
23	Shale, greenish-gray, sandy, slightly calcareous, containing occasional fragments of shells, with considerable interbedded gray shale	3177 - 3200
26	Shale, gray, with a little interbedded greenish-gray slightly calcareous sandy shale	3200 - 3226
18	Shale, dark-gray, with considerable interbedded very dark gray shale	3226 - 3244
8	Shale, dark-gray	3244 - 3252
8	Shale, greenish-gray, slightly clacareous, sandy, with considerable interbedded very dark-gray shale	3252 - 3260
30	Shale, dark-gray, with considerable interbedded greenish-gray siltstone	3260 - 3290
22	Shale, dark-gray, with a little interbedded very dark gray shale	3290 - 3312
5	Siltstone, greenish-gray, slightly calcareous, containing a little muscovite	3312 - 3317
17	Shale, dark-gray, with considerable interbedded greenish-gray siltstone	3317 - 3334
20	Siltstone, light greenish-gray, with a great deal of interbedded gray shale	3334 - 3354
18	Shale, gray to dark-gray, with considerable interbedded greenish-gray sandy shale	3354 - 3372
36	Shale, greenish-gray, sandy, with considerable interbedded gray shale	3372 - 3408

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
22	Shale, gray to dark-gray, with considerable interbedded greenish-gray siltstone	3408 - 3430
30	Shale, dark-gray, with a little interbedded greenish-gray siltstone	3430 - 3460
98	Shale, dark-gray	3460 - 3558
30	Shale, very dark gray, almost black, with considerable interbedded dark-gray shale	3558 - 3588
32	Shale, very dark gray	3588 - 3620
40	Shale, very dark gray, with some interbedded dark-gray shale	3620 - 3660
90	Shale, dark-gray	3660 - 3750
20	Shale, grayish-black	3750 - 3770
60	Shale, very dark gray, with considerable interbedded dark-gray shale	3770 - 3830
8	Shale, grayish-black	3830 - 3838
22	Shale, very dark gray	3838 - 3860
16	Shale, grayish-black, with some interbedded very dark gray shale	3860 - 3876
10	Shale, dark-gray	3876 - 3886
8	Shale, grayish-black	3886 - 3894
26	Shale, dark-gray, with some interbedded very dark gray shale	3894 - 3920
17	Shale, very dark brownish-gray, with considerable interbedded dark-gray shale	3920 - 3937
18	Shale, grayish-black, with considerable interbedded dark-gray shale	3937 - 3955
24	Shale, gray, with some interbedded grayish-black shale	3955 - 3979
56	Shale, grayish-black, with some interbedded gray shale	3979 - 4035
23	Shale, very dark gray, with some interbedded grayish-black shale	4035 - 4058

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
5	Shale, grayish-black	4058 - 4063
24	Shale, very dark gray, with a little interbedded grayish-black shale	4063 - 4087
39	Shale, gray, slightly calcareous	4087 - 4126
24	Shale, very dark gray, with a little interbedded grayish-black shale	4126 - 4150
51	Shale, dark-gray, with some interbedded very dark gray shale	4150 - 4201
15	Shale, grayish-black	4201 - 4216
48	Shale, very dark brownish gray, with some interbedded grayish-black shale	4216 - 4264
21	Shale, very dark brownish-gray, slightly calcareous	4264 - 4285
38	Shale, grayish-black, slightly calcareous, with a very little interbedded dark brownish-gray, dense limestone containing microfossils	4285 - 4323
9	Shale, very dark gray, slightly calcareous	4323 - 4332
38	Shale, grayish-black, slightly calcareous	4332 - 4370
18	Shale, very dark brownish-gray, almost black, somewhat calcareous	4370 - 4388
8	Shale, grayish-black, somewhat calcareous	4388 - 4396
	Middle Devonian Series, 315 feet	
	Hamilton group, 280 feet	
11	Limestone, dense, dark brownish-gray, argillaceous and siliceous	4396 - 4407
13	Limestone, dense, brownish-gray, argillaceous and siliceous, containing a very little light-gray subchalcedonic chert, with some interbedded very dark gray somewhat calcareous shale	4407 - 4420
7	Limestone, dense, brownish-gray, argillaceous and siliceous, containing a very little light-gray subchalcedonic chert, with considerable interbedded dark-gray somewhat calcareous shale	4420 - 4427

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
18	Shale, dark-gray, calcareous	4427 - 4445
50	Shale, dark-gray, somewhat calcareous	4445 - 4495
21	Shale, very dark gray, somewhat calcareous	4495 - 4516
118	Shale, grayish-black, slightly calcareous	4516 - 4634
24	Shale, grayish-black	4634 - 4658
8	Shale, grayish-black, in part somewhat calcareous	4658 - 4666
10	Shale, grayish-black, in part somewhat calcareous, with some interbedded dense brownish-gray somewhat argillaceous limestone	4666 - 4676
	Onondaga limestone, 35 feet	
12	Limestone, dense, dark brownish-gray, somewhat argillaceous	4676 - 4688
9	Limestone, dense, brownish-gray, argillaceous and siliceous, containing some light-gray and a little black subchalcedonic chert	4688 - 4697
14	Limestone, dense, brownish- to dark brownish-gray, argillaceous and siliceous, containing a great deal of light bluish and brownish-gray chalcedonic chert	4697 - 4711
	Lower Devonian Series, 67 feet	
	Oriskany sandstone, 27 feet	
7	Sandstone, fine- to medium-grained, light-gray, quartzose, quartz grains angular to subangular, some showing secondary crystal faces and a few rounded and frosted. 60 M.C.F. GAS at 4712, increased to 100 M.C.F. at 4715. Shot 4711 1/2-4716 1/2 with 35 quarts of nitroglycerine; gauge after shot 116 M.C.F., 2 to 3 barrels SALT WATER per day	4711 - 4718
7	Sandstone, fine- to medium-grained, light-gray, quartzose and slightly calcareous, quartz grains angular to subangular, some showing secondary crystal faces and a few rounded and frosted	4718 - 4725

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
7	Sandstone, fine- to medium-grained, light gray, quartzose and somewhat calcareous, quartz grains angular to subangular, some showing secondary crystal faces and a few rounded and frosted	4725 - 4732
6	Sandstone, fine-grained, light-gray, quartzose and calcareous, quartz grains angular to subangular, some showing secondary crystal faces and a few rounded and frosted	4732 - 4738
	Helderberg limestone, 40 feet	
33	Limestone, dense, very dark brownish gray, somewhat argillaceous, containing fragments of shells	4738 - 4771
7	Limestone, very fine, crystalline, grayish-brown, somewhat argillaceous and sandy	4771 - 4778
	SILURIAN SYSTEM, 150+ feet	
	Upper Silurian or Cayugan Series, 150+ feet	
	Cobleskill limestone, 47 feet	
4	Limestone, dense, brownish-gray, somewhat argillaceous and silty, magnesian	4778 - 4782
14	Limestone, dense, dark to very dark brownish-gray, somewhat argillaceous and slightly magnesian	4782 - 4796
18	Limestone, dense, light-gray, argillaceous, silty and magnesian	4796 - 4814
11	Limestone, dense, very dark brownish-gray, argillaceous and dolomitic	4814 - 4825
	Salina group, 103+ feet	
22	Limestone, dense, dark grayish-brown, argillaceous and magnesian, containing a little very fine crystalline, light brownish-gray anhydrite	4825 - 4847
57	Anhydrite, very fine, crystalline, light brownish-gray, with considerable interbedded dense, very dark brownish-gray somewhat argillaceous and magnesian limestone	4847 - 4904

Lessor and Launer 1, Lot 42

Thickness Feet	Description of Strata	Depth in feet
24	Limestone, dense, dark brownish-gray, somewhat argillaceous and slightly magnesian with a great deal of interbedded very fine crystalline light brownish-gray anhydrite	4904 - 4928
	TOTAL DEPTH	4928

WELL-SAMPLE RECORD

NO.

8

WELL-SAMPLE RECORD

LESSOR AND LAUNER NO. 1 WELL
H. C. DRILLING COMPANY

Warren County, Pa., Kinzua Township, Lot 60.
Warren Quadrangle: 2.42 miles south of 41° 50' N. Lat. and 0.41 mile west of 79° 00' W. Long.
Completed: August 23, 1936.
Elevation: 1944 feet above sea level.
Total depth: 4689 feet.
Deepest formation: Oriskany
Result: Open flow capacity of well from Oriskany sandstone, 620 MCF gas per day with a reservoir pressure of 1795 psi. After shot open flow increased to 1700 MCF, but gas was soon drowned out by salt water.
Samples: 0 to 4540 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 160+ feet	
	Pocono group, 160+ feet	
30	Sandstone, fine- to coarse-grained, light-gray, containing quartz pebbles up to 7 mm. in diameter	0 - 30
30	Sandstone, very fine grained, greenish-gray	30 - 60
20	Shale, greenish-gray, sandy	60 - 80
	Knapp formation, 80 feet	
52	Sandstone, medium- to coarse-grained, light greenish-gray, containing flat quartz pebbles up to 10 mm. in diameter	80 - 132
8	Sandstone, very fine grained, greenish-gray, with some interbedded greenish-gray shale	132 - 140
10	Sandstone, medium-grained, light greenish-gray, containing a few flat quartz pebbles up to 5 mm. in diameter, with some interbedded greenish-gray shale	140 - 150
5	Shale, greenish-gray, sandy	150 - 155

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, medium-grained, light greenish-gray, containing some quartz grains up to 3 mm. in diameter	155 - 160
	DEVONIAN SYSTEM, 4529+ feet	
	Upper Devonian Series, 4206 feet	
	Conewango group, 563 feet	
	Oswayo formation, 275 feet	
8	Shale, greenish-gray	160 - 168
20	Sandstone, fine-grained, light greenish-gray, slightly calcareous, containing some muscovite	168 - 188
29	Shale, greenish-gray	188 - 217
42	Shale, dark greenish-gray, sandy	217 - 259
10	Sandstone, fine-grained, light greenish-gray	259 - 269
14	Shale, dark greenish-gray, sandy	269 - 283
22	Sandstone, fine-grained, light greenish-gray, slightly calcareous	283 - 305
23	Shale, dark greenish-gray, sandy	305 - 328
26	Sandstone, very fine grained, light greenish-gray, slightly calcareous, with some interbedded dark greenish-gray sandy shale	328 - 354
9	Shale, dark-gray	354 - 363
11	Shale, dark greenish-gray, sandy	363 - 374
3	Sandstone, fine-grained, greenish-gray, calcareous, containing abundant fragments of shells - Marvin Creek	374 - 377
5	Shale, dark greenish-gray, sandy	377 - 382
20	Sandstone, very fine grained, greenish-gray, with some interbedded dark-gray shale	382 - 402
8	Shale, dark greenish-gray, sandy	402 - 410

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
17	Sandstone, very fine grained, greenish-gray, containing minute fragments of carbonized plant remains	410 - 427
8	Sandstone, fine-grained, gray, with considerable interbedded grayish-green shale	427 - 435
	Cattaraugus formation, 288 feet	
20	Shale, brick-red, with some interbedded fine-grained, light-gray slightly calcareous sandstone	435 - 455
5	Shale, dark greenish-gray, sandy, with some interbedded brick-red shale	455 - 460
7	Shale, dark-gray	460 - 467
11	Sandstone, fine-grained, light greenish-gray, containing a few quartz grains up to 2 mm. in diameter, with considerable interbedded gray shale	467 - 478
6	Shale, grayish-green, sandy, with a little interbedded brick-red shale	478 - 484
23	Sandstone, fine-grained, light greenish-gray, slightly calcareous, with some interbedded greenish-gray shale	484 - 507
6	Shale, greenish-gray	507 - 513
9	Sandstone, fine-grained, very light greenish-gray, slightly calcareous	513 - 522
19	Shale, brick-red, sandy, with considerable interbedded grayish-green sandy shale	522 - 541
10	Sandstone, very fine grained, greenish-gray	541 - 551
55	Shale, greenish-gray, sandy, with some interbedded gray shale	551 - 606
18	Sandstone, medium- to coarse-grained, light greenish-gray, containing quartz grains up to .4 mm. in diameter, with some interbedded gray shale	606 - 624
38	Shale, dark greenish-gray, in part sandy	624 - 662
16	Sandstone, very fine grained, greenish-gray, with some interbedded dark greenish-gray shale	662 - 678

Thickness Feet	Description of Strata	Depth in feet
9	Shale, dark greenish-gray	678 - 687
20	Shale, brick-red, with some interbedded greenish-gray shale	687 - 707
8	Shale, greenish-gray, sandy	707 - 715
8	Sandstone, coarse-grained, light-gray	715 - 723
	Conneaut group, 673 feet	
34	Shale, greenish-gray, sandy	723 - 757
5	Sandstone, very fine grained, greenish-gray	757 - 762
37	Shale, greenish-gray, sandy, containing fragments of shells, with some interbedded dark-gray shale	762 - 799
	Top of "pink rock"	799
47	Shale, dark grayish-purple, in part sandy, with a little interbedded greenish-gray siltstone	799 - 846
14	Shale, greenish-gray, sandy, containing abundant fragments of shells, with some interbedded dark grayish-purple shale	846 - 860
7	Shale, dark greenish gray,	860 - 867
29	Shale, dark grayish-purple, with some interbedded dark greenish-gray shale	867 - 896
77	Shale, greenish- to dark greenish-gray, sandy, containing abundant fragments of shells	896 - 973
22	Shale, dark grayish-purple, with considerable interbedded dark greenish-gray sandy shale	973 - 995
37	Shale, dark greenish-gray, sandy, containing abundant fragments of shells	995 - 1032
8	Shale, dark purplish-gray	1032 - 1040
51	Siltstone, dark purplish-gray, with some interbedded dark greenish-gray shale	1040 - 1091
14	Shale, dark greenish-gray, sandy	1091 - 1105

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
19	Shale, dark grayish-purple	1105 - 1124
9	Siltstone, greenish-gray, containing abundant fragments of shells	1124 - 1133
15	Shale, greenish-gray, sandy, with some interbedded dark purplish-gray sandy shale	1133 - 1148
	Bottom of "pink rock"	1148
9	Siltstone, greenish-gray, containing fragments of shells, with considerable interbedded greenish-gray shale	1148 - 1157
10	Shale, greenish-gray	1157 - 1167
25	Siltstone, greenish-gray, with some interbedded greenish-gray shale	1167 - 1192
6	Shale, greenish-gray, sandy	1192 - 1198
32	Shale, greenish-gray	1198 - 1230
10	Siltstone, greenish-gray	1230 - 1240
20	Shale, greenish-gray, sandy	1240 - 1260
10	Siltstone, greenish-gray	1260 - 1270
15	Shale, greenish-gray	1270 - 1285
10	Siltstone, greenish-gray	1285 - 1295
10	Sandstone, very fine grained, greenish-gray, slightly calcareous	1295 - 1305
48	Shale, greenish-gray, with some interbedded greenish-gray siltstone	1305 - 1353
43	Siltstone, greenish-gray, containing fragments of shells, with a little interbedded greenish-gray shale	1353 - 1396
	Bottom of Conneaut group	1396
59	Shale, greenish-gray	1396 - 1455
10	Sandstone, very fine grained, with a great deal of interbedded greenish-gray shale	1455 - 1465

Thickness Feet	Description of Strata	Depth in feet
23	Shale, greenish-gray, with a little interbedded very fine grained light greenish-gray sandstone	1465 - 1488
	Top of Clarendon sand	1488
11	Sandstone, very fine grained, light greenish-gray, with some interbedded greenish-gray shale	1488 - 1499
11	Sandstone, medium-grained, light greenish-gray, with some interbedded greenish-gray shale; show of OIL at 1509	1499 - 1510
10	Sandstone, fine-grained, light greenish-gray, with some interbedded greenish-gray shale	1510 - 1520
	Bottom of Clarendon sand	1520
35	Shale, greenish-gray, with some interbedded very fine grained light greenish-gray sandstone	1520 - 1555
	Top of Gartland sand	1555
13	Sandstone, very fine grained, greenish-gray, with some interbedded greenish-gray shale	1555 - 1568
13	Sandstone, fine-grained, light greenish-gray, with some interbedded greenish-gray shale	1568 - 1581
	Bottom of Gartland sand	1581
48	Shale, greenish-gray, with some interbedded greenish-gray siltstone	1581 - 1629
66	Siltstone, greenish-gray, with some interbedded greenish-gray shale	1629 - 1695
245	Shale, greenish-gray, with some interbedded greenish-gray siltstone containing fragments of shells	1695 - 1940
36	Sandstone, very fine grained, light greenish-gray, with considerable interbedded greenish-gray shale	1940 - 1976
18	Shale, greenish-gray	1976 - 1994

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
10	Sandstone, very fine grained, light grayish-brown, with considerable interbedded greenish-gray shale, Bradford Third sand	1994 - 2004
12	Shale, greenish-gray	2004 - 2016
35	Siltstone, light greenish-gray, with considerable interbedded greenish-gray shale	2016 - 2051
91	Shale, greenish-gray	2051 - 2142
45	Shale, greenish-gray, with some interbedded greenish-gray siltstone	2142 - 2187
23	Siltstone, greenish-gray, with some interbedded greenish-gray shale	2187 - 2210
33	Shale, greenish-gray	2210 - 2243
79	Shale, greenish-gray, with some interbedded greenish-gray siltstone	2243 - 2322
85	Shale, greenish-gray	2322 - 2407
96	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	2407 - 2503
29	Shale, greenish-gray, with considerable interbedded greenish-gray siltstone	2503 - 2532
29	Shale, greenish-gray	2532 - 2561
60	Shale, gray, with some interbedded greenish-gray siltstone	2561 - 2621
8	Siltstone, greenish-gray, with considerable interbedded gray shale	2621 - 2629
37	Shale, gray	2629 - 2666
27	Shale, gray, with some interbedded greenish-gray siltstone	2666 - 2693
13	Shale, gray	2693 - 2706
2	Siltstone, greenish-gray	2706 - 2708
69	Shale, gray, with considerable interbedded dark-gray shale	2708 - 2777
20	Shale, dark-gray, with some interbedded greenish-gray siltstone	2777 - 2797

Thickness Feet	Description of Strata	Depth in feet
12	Shale, dark-gray, with considerable interbedded gray shale	2797 - 2809
36	Siltstone, greenish-gray, with some interbedded dark-gray shale	2809 - 2845
31	Shale, gray, with some interbedded dark-gray shale and greenish-gray siltstone	2845 - 2876
15	Shale, very dark gray, almost black, with a great deal of interbedded gray shale	2876 - 2891
49	Shale, gray, with a great deal of interbedded very dark gray shale	2891 - 2940
83	Shale, greenish-gray, sandy, slightly calcareous, with some interbedded gray- to dark-gray shale	2940 - 3023
47	Siltstone, light greenish-gray, containing a little muscovite	3023 - 3070
20	Shale, gray, with some interbedded grayish-black shale and a little greenish-gray, slightly calcareous siltstone	3070 - 3090
8	Shale, gray	3090 - 3098
9	Shale, grayish-black	3098 - 3107
21	Siltstone, greenish-gray, slightly calcareous, with some interbedded gray shale	3107 - 3128
64	Shale, gray, with some interbedded dark-gray shale	3128 - 3192
38	Shale, gray, with considerable interbedded greenish-gray siltstone	3192 - 3230
12	Siltstone, gray, slightly calcareous	3230 - 3242
14	Shale, gray, with some interbedded greenish-gray slightly calcareous siltstone	3242 - 3256
9	Shale, greenish-gray	3256 - 3265
12	Shale, gray to very dark gray	3265 - 3277
60	Siltstone, light greenish-gray to gray	3277 - 3337
36	Shale, gray, with some interbedded greenish-gray siltstone	3337 - 3373

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
12	Shale, very dark gray	3373 - 3385
27	Shale, gray, with some interbedded gray siltstone	3385 - 3412
95	Shale, gray, with some interbedded dark-gray shale	3412 - 3507
66	Shale, grayish-black, with some interbedded dark-gray shale	3507 - 3573
34	Shale, grayish-black	3573 - 3607
39	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	3607 - 3646
72	Shale, dark-gray	3646 - 3718
14	Shale, grayish-black	3718 - 3732
20	Shale, dark to very dark gray	3732 - 3752
20	Shale, dark-gray, with considerable interbedded grayish-black shale	3752 - 3772
52	Shale, grayish-black, with some interbedded dark-gray shale	3772 - 3824
87	Shale, dark-gray, with some interbedded grayish-black shale	3824 - 3911
48	Shale, gray, with a little interbedded grayish-black shale	3911 - 3959
21	Shale, grayish-black, with considerable interbedded dark-gray shale	3959 - 3980
24	Shale, very dark gray, with considerable interbedded gray shale	3980 - 4004
33	Shale, very dark gray	4004 - 4037
60	Shale, dark-gray, slightly calcareous	4037 - 4097
65	Shale, dark-gray, with some interbedded grayish-black shale	4097 - 4162
23	Shale, grayish-black	4162 - 4185
68	Shale, dark to very dark gray, slightly calcareous	4185 - 4253

Thickness Feet	Description of Strata	Depth in feet
19	Shale, grayish-black, somewhat calcareous	4253 - 4272
9	Shale, dark-gray, slightly calcareous	4272 - 4281
2	Limestone, very fine, dense, brownish-gray	4281 - 4283
20	Shale, very dark gray to black, somewhat calcareous	4283 - 4303
53	Shale, very dark gray, somewhat calcareous	4303 - 4356
10	Shale, very dark gray to black, somewhat calcareous	4356 - 4366
	Middle Devonian Series, 313 feet	
	Hamilton group, 254 feet	
3	Limestone, very fine, dense, brownish-gray, argillaceous	4366 - 4369
1	Shale, very dark gray, somewhat calcareous	4369 - 4370
3	Limestone, very fine, dense, brownish-gray, argillaceous	4370 - 4373
3	Shale, very dark gray, somewhat calcareous	4373 - 4376
19	Limestone, very fine, dense, brownish-gray, argillaceous and siliceous, with some interbedded dark-gray, somewhat calcareous shale. A little light brownish-gray chalcedonic chert occurs in limestone in lower part	4376 - 4395
39	Shale, very dark gray, calcareous, containing occasional fragments of shells	4395 - 4434
62	Shale, very dark gray, somewhat calcareous	4434 - 4496
34	Shale, grayish-black, somewhat calcareous	4496 - 4530
10	Shale, very dark gray, calcareous	4530 - 4540
149	No samples	4540 - 4689
	From drillers' log	
80	Shale, black	4540 - 4620

Lessor and Launer 1, Lot 60

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 59 feet	
59	Lime, hard	4620 - 4679
	Lower Devonian Series, 10+ feet	
	Oriskany sandstone, 10+ feet	
10	Sand, 620 MCF GAS before shot, 1,700 MCF after shot, reservoir pressure, 1795 pounds, gas was soon drowned out by SALT WATER	4679 - 4689
	TOTAL DEPTH	4689

WELL-SAMPLE RECORD

NO. 9

WELL-SAMPLE RECORD

M. W. JAMIESON NO. 1 WELL
THE SYLVANIA CORPORATION

Warren County, Pa.; Kinzua Township, Lot 47
Kinzua Quadrangle: 2.37 miles south of 41° 50' N. Lat. and 0.81 mile east of 79° 00' W. Long.
Completed: March 10, 1937.
Elevation: 2055 feet above sea level.
Total depth: 4830 feet.
Deepest formation: Helderberg.
Result: Gas pocket at 4766 feet in Onondaga, 200 gallons of salt water in 24 hours at 4801-4805 feet in Oriskany. Abandoned as a dry hole.
Samples: 0 to 4830 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	PENNSYLVANIAN SYSTEM, 130+ feet	
	Upper Pottsville-Kanawha Series, 130+ feet	
25	Sandstone, fine-grained, light greenish-gray, stained yellowish-brown by weathering	0 - 25
10	Sandstone, medium-grained, light-gray, stained yellowish-brown	25 - 35
10	Sandstone, coarse-grained, light-gray, quartzose, containing some subrounded quartz pebbles up to 5 mm. in diameter	35 - 45
40	Sandstone, medium-grained, light-gray, quartzose, containing a few quartz grains up to 4 mm. in diameter	45 - 85
5	Sandstone, coarse-grained, light-gray, quartzose, containing a little interbedded grayish-black sandy shale	85 - 90
22	Sandstone, coarse-grained, light-gray, quartzose, containing a little muscovite, with considerable interbedded dark greenish-gray sandy micaceous shale containing some carbonized plant remains	90 - 112
18	Sandstone, very coarse grained, conglomeratic, light-gray, containing abundant rounded quartz pebbles up to 5 mm. in diameter, with considerable interbedded dark greenish-gray sandy micaceous shale	112 - 130

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 118 feet	
	Pocono group, 118 feet	
20	Shale, dark greenish-gray, micaceous	130 - 150
14	Sandstone, medium- to coarse-grained, light-gray	150 - 164
2	Sandstone, very coarse grained, conglomeratic, containing quartz grains up to 5 mm. in diameter	164 - 166
1	Sandstone, very fine grained, light-gray, calcareous, containing occasional fragments of brachiopod shells	166 - 167
3	Shale, dark-gray, silty and slightly calcareous, containing a little muscovite	167 - 170
5	Sandstone, very fine grained, light greenish-gray, slightly calcareous, containing a little muscovite and an occasional quartz grain up to 2 mm. in diameter	170 - 175
3	Shale, dark-gray, silty	175 - 178
13	Sandstone, very fine to fine-grained, light-gray, quartzose, containing a little muscovite	178 - 191
	Knapp formation, 57 feet	
15	Conglomerate, light-gray to white, containing discoidal shaped quartz pebbles up to 10 mm. in diameter and occasional jasper grains, with some interbedded fine-grained light-gray sandstone and a little dark-gray silty shale	191 - 206
6	Sandstone, conglomeratic, light-gray to white, containing some discoidal shaped quartz pebbles up to 5 mm. in diameter, with some interbedded dark-gray silty shale	206 - 212
11	Sandstone, fine- to medium-grained, light-gray	212 - 223
7	Shale, dark-gray, silty, with some interbedded greenish-gray siltstone	223 - 230

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, dark-gray, silty, with considerable interbedded fine- to medium-grained light-gray sandstone	230 - 236
7	Shale, dark-gray, silty	236 - 243
5	Sandstone, fine- to medium-grained, light-gray, containing a few quartz grains up to 3 mm. in diameter	243 - 248
	DEVONIAN SYSTEM, 4582+ feet	
	Upper Devonian Series, 4216 feet	
	Conewango group, 538 feet	
	Oswayo formation, 256 feet	
8	Sandstone, very fine to fine-grained, dark greenish-gray, with some interbedded very fine grained light greenish-gray sandstone	248 - 256
44	Shale, dark greenish-gray	256 - 300
8	Shale, dark-gray, silty and somewhat micaceous	300 - 308
16	Siltstone, greenish-gray, containing some muscovite, with some interbedded dark-gray shale	308 - 324
28	Shale, dark-gray, with considerable interbedded greenish-gray micaceous siltstone	324 - 352
7	Shale, greenish-gray, sandy and micaceous, with a little interbedded dark-gray shale	352 - 359
6	Shale, greenish-gray	359 - 365
9	Siltstone, greenish-gray	365 - 374
5	Shale, greenish-gray, silty	374 - 379
9	Siltstone, greenish-gray, containing abundant fragments of shells	379 - 388
9	Shale, greenish-gray, silty	388 - 397
31	Shale, dark greenish-gray, with some interbedded greenish-gray micaceous siltstone	397 - 428
10	Shale, dark greenish-gray, with considerable interbedded greenish-gray siltstone containing fragments of carbonized plant remains	428 - 438

Thickness Feet	Description of Strata	Depth in feet
12	Siltstone, light greenish-gray, containing fragments of shells	438 - 450
6	Siltstone, light greenish-gray, containing a little muscovite, with some interbedded dark-gray shale	450 - 456
33	Sandstone, very fine grained, light greenish-gray, containing a little miscovite and occasional shell fragments with a little interbedded greenish-gray shale	456 - 489
15	Sandstone, very fine grained, greenish-gray, slightly calcareous, containing some muscovite, with some interbedded dark-gray silty shale	489 - 504
	Cattaraugus formation, 282 feet	
14	Shale, brick-red, with considerable interbedded grayish-green shale and very fine grained greenish-gray sandstone	504 - 518
13	Sandstone, very fine grained, light greenish-gray, slightly calcareous, containing some muscovite	518 - 531
4	Shale, brick-red, silty, with some interbedded grayish-green silty shale	531 - 535
5	Sandstone, very fine grained, greenish-gray, micaceous	535 - 540
8	Shale, grayish-green, silty, with some interbedded dark-gray shale	540 - 548
15	Sandstone, very fine grained, greenish-gray, micaceous, with some interbedded brick-red and greenish-gray shale	548 - 563
6	Shale, brick-red, silty, with considerable interbedded greenish-gray somewhat calcareous siltstone	563 - 569
5	Sandstone, very fine grained, greenish-gray, micaceous and slightly calcareous	569 - 574
7	Siltstone, greenish-gray, micaceous, with some interbedded brick-red silty shale	574 - 581
12	Sandstone, very fine grained, light greenish-gray, with some interbedded dark greenish-gray shale	581 - 593

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
13	Shale, dark brick-red, silty and micaceous, with a little interbedded grayish-green siltstone	593 - 606
19	Shale, greenish-gray, silty, with considerable interbedded brick-red silty shale	606 - 625
5	Shale, dark-gray, silty, with considerable interbedded greenish-gray, slightly calcareous siltstone	625 - 630
25	Siltstone, greenish-gray, containing fragments of shells, with some interbedded gray shale	630 - 655
11	Shale, dark-gray, with some interbedded greenish-gray silty shale	655 - 666
10	Sandstone, very fine grained, greenish-gray, slightly calcareous, with considerable interbedded greenish-gray shale	666 - 676
3	Shale, dark-gray, silty	676 - 679
1	Sandstone, very fine grained, greenish-gray, with occasional rounded quartz grains up to 2 mm. in diameter	679 - 680
13	Sandstone, very fine grained, light greenish-gray, containing some muscovite	680 - 693
18	Sandstone, fine-grained, light greenish-gray, containing some muscovite	693 - 711
19	Shale, dark-gray, with some interbedded greenish-gray silty shale	711 - 730
30	Shale, dark purplish-red, silty and micaceous, with some interbedded greenish-gray silty and micaceous shale and a little dark-gray shale	730 - 760
5	Shale, dark-gray, with considerable interbedded greenish-gray silty and micaceous shale, slightly clacareous	760 - 765
11	Shale, greenish-gray, silty and micaceous, with some interbedded brick-red shale	765 - 776
10	Shale, greenish-gray, silty, with considerable interbedded dark purplish-red silty shale	776 - 786

Thickness Feet	Description of Strata	Depth in feet
	Conneaut group, 708 feet	
30	Shale, greenish-gray, silty	786 - 816
28	Shale, greenish-gray, with some interbedded greenish-gray silty shale containing fragments of shells	816 - 844
65	Shale, greenish-gray, silty, containing fragments of shells, with some interbedded dark-gray shale	844 - 909
	Top of "pink rock"	909
24	Shale, dark purplish-gray, silty and micaceous, containing fragments of shells, with some interbedded greenish-gray silty shale	909 - 933
8	Shale, greenish-gray, silty, containing fragments of shells, with considerable interbedded dark-gray shale	933 - 941
14	Shale, dark purplish-gray, with some interbedded greenish-gray shale containing fragments of shells	941 - 955
6	Shale, dark purplish-gray, with some interbedded dark-gray shale	955 - 961
8	Shale, greenish-gray, silty, with a little interbedded dark purplish-gray shale	961 - 969
30	Shale, greenish-gray	969 - 999
9	Shale, dark-gray, with some interbedded greenish-gray siltstone containing fragments of shells	999 - 1008
18	Shale, dark-gray, with some interbedded dark purplish-gray shale and some greenish-gray siltstone containing fragments of shells	1008 - 1026
16	Shale, dark-gray, with some interbedded greenish-gray siltstone containing fragments of shells	1026 - 1042
14	Shale, dark-gray, with some interbedded dark purplish-gray silty shale and some greenish-gray siltstone containing fragments of shells	1042 - 1056

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, dark-gray, with some interbedded greenish-gray siltstone containing fragments of shells	1056 - 1064
14	Shale, dark purplish-gray, with some interbedded greenish-gray silty shale	1064 - 1078
8	Shale, dark purplish-gray, silty, with some interbedded dark-gray shale and some greenish-gray siltstone containing fragments of shells	1078 - 1086
39	Shale, dark-gray, with considerable interbedded greenish-gray silty shale and some light-gray siltstone containing abundant fragments of shells	1086 - 1125
8	Shale, dark greenish-gray, silty, containing abundant fragments of shells	1125 - 1133
11	Shale, dark-gray, with considerable interbedded dark purplish-gray shale and some dark greenish-gray silty shale containing fragments of shells	1133 - 1144
6	Shale, dark greenish-gray, silty, with some interbedded dark purplish-gray shale and some greenish-gray siltstone containing fragments of shells	1144 - 1150
33	Shale, dark purplish-gray, in part silty, with considerable interbedded dark greenish-gray silty and micaceous shale	1150 - 1183
9	Siltstone, greenish-gray, containing fragments of shells, with considerable interbedded dark purplish-gray siltstone containing fragments of shells and some greenish-gray shale	1183 - 1192
23	Shale, dark-gray, with considerable interbedded dark purplish-gray shale, in part silty	1192 - 1215
13	Shale, dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	1215 - 1228
7	Shale, dark-gray, with some interbedded dark-gray siltstone	1228 - 1235

Thickness Feet	Description of Strata	Depth in feet
9	Shale, dark-gray, with considerable interbedded dark greenish-gray silty and slightly calcareous shale and some dark purplish-gray shale	1235 - 1244
	Bottom of "pink rock"	1244
9	Shale, dark-gray, with some interbedded greenish-gray silty and micaceous shale and some light greenish-gray, slightly calcareous siltstone	1244 - 1253
61	Shale, dark greenish-gray	1253 - 1314
22	Shale, dark-gray, with considerable interbedded greenish-gray silty shale	1314 - 1336
26	Shale, greenish-gray, silty, with considerable interbedded dark-gray shale	1336 - 1362
18	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1362 - 1380
44	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	1380 - 1424
23	Shale, very dark purplish-gray, in part silty, with some interbedded greenish-gray silty shale containing fragments of shells	1424 - 1447
16	Siltstone, light greenish-gray, with considerable interbedded gray silty shale	1447 - 1463
	Top of Glade sand	1463
8	Sandstone, very fine grained, light greenish-gray, somewhat calcareous, with a great deal of interbedded gray shale	1463 - 1471
14	Shale, gray, with a great deal of interbedded very fine grained, light greenish-gray somewhat calcareous sandstone	1471 - 1485
9	Sandstone, very fine grained, light greenish gray, somewhat calcareous, with a great deal of interbedded gray shale	1485 - 1494
	Bottom of Glade sand and Conneaut group	1494
6	Shale, dark-gray	1494 - 1500

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
29	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1500 - 1529
26	Shale, gray, with considerable interbedded greenish-gray silty shale	1529 - 1555
6	Siltstone, greenish-gray, containing fragments of shells, with considerable interbedded dark-gray shale	1555 - 1561
	Top of Clarendon sand	1561
6	Sandstone, very coarse, conglomeratic, light-gray, containing quartz grains up to 3 mm. in diameter, with a great deal of interbedded gray shale	1561 - 1567
11	Shale, gray, with considerable interbedded very coarse, conglomeratic, light-gray sandstone, containing rounded quartz grains up to 5 mm. in diameter	1567 - 1578
	Bottom of Clarendon sand	1578
15	Shale, gray, with a little interbedded fine-grained, light greenish-gray sandstone	1578 - 1593
9	Shale, gray, with some interbedded light greenish-gray siltstone	1593 - 1602
9	Shale, gray	1602 - 1611
	Top of Gartland sand	1611
9	Sandstone, very fine grained, light greenish-gray, slightly calcareous, containing occasional rounded quartz grains up to 2 mm. in diameter, with a great deal of interbedded dark-gray shale	1611 - 1620
6	Sandstone, very fine grained, light greenish-gray, friable, containing a little muscovite, with considerable interbedded gray shale	1620 - 1626
20	Sandstone, very fine to fine-grained, light greenish-gray, containing a little muscovite, with a little interbedded gray shale	1626 - 1646
	Bottom of Gartland sand	1646
22	Shale, dark-gray	1646 - 1668
6	Shale, gray	1668 - 1674

Thickness Feet	Description of Strata	Depth in feet
26	Shale, dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	1674 - 1700
10	Shale, gray	1700 - 1710
15	Shale, dark-gray, with considerable interbedded greenish-gray siltstone	1710 - 1725
7	Shale, dark-gray, with some interbedded brownish-gray siltstone	1725 - 1732
61	Shale, dark-gray, with considerable interbedded greenish-gray, micaceous siltstone	1732 - 1793
17	Shale, dark-gray, with some interbedded very fine grained light greenish-gray sandstone	1793 - 1810
48	Shale, dark-gray, with some interbedded greenish-gray siltstone	1810 - 1858
30	Shale, dark-gray, with a great deal of interbedded greenish-gray siltstone	1858 - 1888
20	Shale, dark-gray, with some interbedded greenish-gray siltstone	1888 - 1908
37	Shale, dark-gray, with a great deal of interbedded light greenish-gray, somewhat calcareous siltstone containing fragments of shells	1908 - 1945
30	Shale, dark-gray, with a little interbedded greenish-gray siltstone	1945 - 1975
12	Shale, gray, with a little interbedded greenish-gray siltstone	1975 - 1987
22	Shale, dark-gray, with some interbedded greenish-gray siltstone	1987 - 2009
20	Siltstone, greenish-gray, with considerable interbedded brownish-gray siltstone and some dark-gray shale	2009 - 2029
14	Shale, gray, with a little interbedded light greenish-gray siltstone	2029 - 2043
3	Sandstone, very fine grained, light greenish-gray, containing a little muscovite	2043 - 2046

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, dark-gray, with a great deal of interbedded very fine grained, light greenish-gray sandstone containing a little muscovite	2046 - 2054
14	Sandstone, very fine grained, light greenish-gray, containing some muscovite, with a great deal of interbedded dark-gray shale	2054 - 2068
7	Shale, very dark gray, silty, with considerable interbedded light greenish-gray siltstone	2068 - 2075
26	Siltstone, light greenish-gray, slightly calcareous, with a great deal of interbedded dark to very dark gray shale	2075 - 2101
53	Shale, dark to very dark gray, with considerable interbedded light greenish-gray siltstone	2101 - 2154
9	Shale, greenish-gray, with a little interbedded light greenish-gray siltstone	2154 - 2163
9	Shale, dark-gray, with a little interbedded light greenish-gray siltstone	2163 - 2172
17	Shale, dark greenish-gray, with a little interbedded greenish-gray siltstone	2172 - 2189
8	Shale, dark-gray, with a little interbedded greenish-gray silty shale	2189 - 2197
21	Shale, gray	2197 - 2218
17	Siltstone, chocolate-brown, with a great deal of interbedded greenish-gray silty shale	2218 - 2235
47	Siltstone, dark chocolate-brown, with a great deal of interbedded dark-gray shale	2235 - 2282
43	Shale, gray to dark-gray	2282 - 2325
22	Shale, greenish-gray, in part silty, with considerable interbedded dark chocolate-brown siltstone	2325 - 2347
17	Shale, dark-gray, with considerable interbedded dark chocolate-brown siltstone and a little light greenish-gray, somewhat calcareous siltstone containing occasional fragments of shells	2347 - 2364

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Siltstone, greenish- and brownish-gray, slightly calcareous, with considerable interbedded gray shale	2364 - 2394
66	Shale, dark-gray	2394 - 2460
66	Shale, dark-gray, with considerable interbedded greenish-gray, somewhat calcareous siltstone	2460 - 2526
88	Shale, dark to very dark gray, with a little interbedded greenish-gray siltstone	2526 - 2614
8	Shale, dark-gray, silty, with a great deal of interbedded greenish-gray siltstone	2614 - 2622
7	Shale, very dark gray	2622 - 2629
56	Shale, dark-gray	2629 - 2685
61	Shale, dark-gray, with a little interbedded greenish-gray, somewhat calcareous siltstone and a little dark brownish-gray siltstone	2685 - 2746
20	Shale, gray	2746 - 2766
20	Shale, dark-gray, with considerable interbedded greenish-gray, silty shale	2766 - 2786
22	Shale, dark-gray	2786 - 2808
33	Shale, dark-gray, with a little interbedded greenish-gray siltstone and a little dark brownish-gray siltstone	2808 - 2841
19	Shale, very dark gray to grayish-black, silty, with some interbedded dark-gray shale and a little greenish-gray siltstone	2841 - 2860
10	Shale, dark-gray, with a little interbedded greenish-gray siltstone and a little dark brownish-gray siltstone	2860 - 2870
88	Shale, grayish-black, silty, with some interbedded dark-gray shale, in part finely laminated, containing minute spherical pyrite concretions	2870 - 2958
10	Shale, very dark gray, silty	2958 - 2968

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
21	Shale, dark-gray, with some interbedded greenish-gray silty shale and a little very dark gray silty shale	2968 - 2989
22	Shale, grayish-black with some interbedded dark-gray shale and some greenish-gray somewhat calcareous siltstone	2989 - 3011
10	Shale, gray	3011 - 3021
54	Shale, greenish-gray, silty, with considerable interbedded gray to dark-gray shale	3021 - 3075
37	Shale, dark greenish-gray, micaceous, with some interbedded dark-gray shale	3075 - 3112
16	Shale, greenish-gray, sandy, micaceous	3112 - 3128
44	Shale, greenish-gray, sandy, micaceous, with some interbedded gray shale	3128 - 3172
28	Shale, grayish-black, with a little interbedded gray shale and a little greenish-gray silty shale	3172 - 3200
8	Shale, greenish-gray, silty and somewhat calcareous	3200 - 3208
12	Shale, gray to dark-gray, with some interbedded greenish-gray, somewhat calcareous siltstone	3208 - 3220
115	Shale, greenish-gray, slightly calcareous, containing occasional shell fragments, with some interbedded dark-gray silty shale and a little gray shale	3220 - 3335
14	Shale, gray, with some interbedded greenish-gray, somewhat calcareous siltstone	3335 - 3349
11	Shale, gray, with considerable interbedded greenish-gray, slightly calcareous silty shale	3349 - 3360
30	Siltstone, greenish-gray, micaceous, with considerable interbedded gray shale	3360 - 3390
32	Shale, greenish-gray, sandy and micaceous, with considerable interbedded gray shale	3390 - 3422

Thickness Feet	Description of Strata	Depth in feet
46	Shale, gray, with considerable interbedded greenish-gray, micaceous siltstone and some greenish-gray micaceous silty shale	3422 - 3468
32	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	3468 - 3500
10	Shale, very dark gray to grayish-black, with considerable interbedded gray shale	3500 - 3510
18	Shale, very dark gray to grayish-black, with some interbedded greenish-gray shale and a little greenish-gray siltstone	3510 - 3528
17	Shale, gray, with some interbedded very dark gray silty shale and a little greenish-gray somewhat calcareous silty shale	3528 - 3545
10	Shale, gray, with considerable interbedded very dark gray to grayish-black shale	3545 - 3555
47	Shale, dark-gray, with some interbedded grayish-black shale and some greenish-gray somewhat calcareous silty shale	3555 - 3602
62	Shale, grayish-black, with considerable interbedded dark-gray shale	3602 - 3664
28	Shale, grayish-black, with a little interbedded dark-gray shale	3664 - 3692
18	Shale, gray, with some interbedded very dark gray shale and some greenish-gray siltstone	3692 - 3710
62	Shale, dark-gray, with some interbedded very dark gray, almost black shale, and a little greenish-gray siltstone	3710 - 3772
36	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	3772 - 3808
30	Shale, grayish-black, with considerable interbedded dark-gray shale and a little greenish-gray siltstone	3808 - 3838
82	Shale, dark-gray, with some interbedded grayish-black shale	3838 - 3920
7	Shale, grayish-black	3920 - 3927
51	Shale, very dark gray, with some interbedded grayish-black shale	3927 - 3978

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Shale, very dark gray	3978 - 3987
44	Shale, grayish-black, with some interbedded dark to very dark gray shale	3987 - 4031
21	Shale, very dark gray, with some interbedded grayish-black shale	4031 - 4052
48	Shale, dark-gray, with considerable interbedded grayish-black shale	4052 - 4100
20	Shale, dark-gray, with considerable interbedded grayish-black shale and some dark-gray silty shale containing fragments of plant remains	4100 - 4120
22	Shale, dark-gray, with considerable interbedded grayish-black shale	4120 - 4142
10	Shale, dark-gray, very slightly calcareous	4142 - 4152
10	Shale, dark-gray, slightly calcareous, with some interbedded grayish-black shale	4152 - 4162
48	Shale, very dark gray, very slightly calcareous	4162 - 4210
20	Shale, grayish-black, with some interbedded very dark gray, slightly calcareous shale	4210 - 4230
32	Shale, very dark gray, slightly calcareous, in part finely laminated, with some interbedded grayish-black shale	4230 - 4262
58	Shale, grayish-black	4262 - 4320
15	Shale, grayish-black, with considerable interbedded very dark gray, slightly calcareous shale	4320 - 4335
9	Shale, grayish-black	4335 - 4344
22	Shale, grayish-black, somewhat calcareous, with some interbedded very fine, crystalline, dark brownish-gray limestone, containing minute Styliolina shells in abundance	4344 - 4366
9	Shale, grayish-black, slightly calcareous	4366 - 4375
33	Shale, very dark gray, very slightly calcareous, containing fragments of brachiopod shells, with a little interbedded very fine, dense, brownish-gray limestone	4375 - 4408

Thickness Feet	Description of Strata	Depth in feet
12	Shale, grayish-black, very slightly calcareous	4408 - 4420
44	Shale, very dark gray, somewhat calcareous	4420 - 4464
	Middle Devonian Series, 335 feet	
	Hamilton group, 381 feet	
18	Limestone, very fine, dense, dark brownish-gray, argillaceous and fossiliferous, with a great deal of interbedded very dark somewhat calcareous shale	4464 - 4482
7	Limestone, very fine, dense, light- to dark brownish-gray, argillaceous and siliceous, containing a little light brownish-gray porcelaneous chert, with considerable interbedded very dark gray somewhat calcareous shale	4482 - 4489
11	Limestone, very fine, dense, light brownish- to brownish-gray, siliceous, containing a little light brownish-gray subchalcedonic chert	4489 - 4502
17	Shale, dark-gray, calcareous	4502 - 4519
48	Shale, very dark gray, somewhat calcareous	4519 - 4567
13	Shale, grayish-black, somewhat calcareous	4567 - 4580
10	Shale, very dark gray, calcareous	4580 - 4590
24	Shale, grayish-black, somewhat calcareous	4590 - 4614
34	Shale, grayish-black, calcareous	4614 - 4648
28	Shale, very dark gray, calcareous, with considerable interbedded grayish-black somewhat calcareous shale	4648 - 4676
54	Shale, grayish-black, with a very little interbedded very fine, dense light brownish-gray limestone	4676 - 4730
15	Shale, grayish-black	4730 - 4745
	Onondaga limestone, 54 feet	
23	Limestone, very fine, dense, dark- to very dark brownish-gray, somewhat argillaceous, containing fragments of shells and a very little black semichalcedonic chert; GAS pocket at 4766 feet	4745 - 4768

Jamieson No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Limestone, very fine, dense, brownish-gray, siliceous, containing considerable brownish-gray subchalcedonic chert	4768 - 4788
11	Chert, light brownish-gray, subchalcedonic, with some interbedded dense brownish-gray, siliceous limestone	4788 - 4799
	Lower Devonian Series, 31+ feet	
	Oriskany sandstone, 20 feet	
6	Sandstone, fine- to medium-grained, light-gray, quartzose and somewhat calcareous; 200 gallons SALT WATER in 24 hours, 4801-4805	4799 - 4805
7	Sandstone, fine- to medium-grained, light-gray, quartzose. Quartz grains angular to subangular with a few showing secondary crystal facets	4805 - 4812
2	Sandstone, fine-grained, light-gray, quartzose and somewhat calcareous. Quartz grains angular to subangular	4812 - 4814
3	Sandstone, fine-grained, light-gray, quartzose and slightly calcareous	4814 - 4817
2	Sandstone, fine-grained, light-gray, quartzose and somewhat calcareous	4817 - 4819
	Helderberg limestone, 11+ feet	
7	Limestone, very fine, dense, light grayish- to grayish-brown, slightly argillaceous and magnesian	4819 - 4826
4	Limestone, very fine, dense, dark grayish-brown, slightly argillaceous and somewhat magnesian	4826 - 4830
	TOTAL DEPTH	4830

WELL-SAMPLE RECORD

NO.

10

WELL-SAMPLE RECORD

E. A. WILLIAMS NO. 1 WELL
APPALACHIAN DEVELOPMENT CORPORATION

Warren County, Pa., Corydon Township, Warrant 3729
Kinzua Quadrangle: 2.41 miles south of 42° 00' N. Lat. and .73 mile west of 78° 55' W. Long.
Completed: August 25, 1944.
Elevation: 1266 feet above sea level.
Total depth: 3542 feet.
Result: Two and one-half bailers of salt water in one and one-half hours at 3527 feet in Oriskany.
Samples: 0 to 3542 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Pleistocene, 71 feet	
6	Soil	0 - 6
65	Gravel and sand including pebbles of granite, much FRESH WATER	6 - 71
	DEVONIAN SYSTEM, 3542+ feet	
	Upper Devonian Series, 3125+ feet	
	Conneaut group, 393+ feet	
10	Shale, dark purplish gray, silty, with some interbedded greenish gray silty shale containing fragments of shells	71 - 81
17	Shale, purplish gray, sandy and silty, somewhat calcareous, containing some muscovite and fragments of shells	81 - 98
41	Shale, dark greenish and purplish gray, silty, containing some muscovite and fragments of shells	98 - 139
6	Siltstone, greenish gray, somewhat calcareous, containing some muscovite and fragments of shells with considerable interbedded greenish-gray silty shale	139 - 145

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Shale, greenish gray, in part silty, containing fragments of shells, with some interbedded dark purplish-gray silty shale and a little brick-red, oolitic, sandy hematite	145 - 150
	Bottom of "pink rock"	150
6	Shale, greenish gray, in part silty	150 - 156
32	Shale, gray to dark gray, with a little interbedded greenish-gray siltstone containing occasional fragments of shells	156 - 188
30	Shale, dark gray	188 - 218
62	Shale, gray to dark gray, with a little interbedded greenish-gray siltstone containing fragments of shells	218 - 280
33	Shale, gray	280 - 313
5	Siltstone, greenish gray, containing abundant fragments of shells	313 - 318
7	Shale, greenish gray, silty, containing fragments of shells	318 - 325
11	Siltstone, greenish gray, containing some muscovite and fragments of shells, with some interbedded gray shale	325 - 336
8	Shale, greenish gray, silty, containing fragments of shells with considerable interbedded purplish-gray silty shale, much FRESH WATER at 108-343	336 - 344
11	Siltstone, greenish gray, containing some muscovite and fragments of shells with a little interbedded purplish-gray shale, very slight show of OIL in siltstone	344 - 355
13	Shale, greenish gray, in part silty, containing some muscovite and fragments of shells	355 - 368
9	Siltstone, greenish gray, containing fragments of shells with some interbedded greenish-gray silty shale	368 - 377

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
	Top of Glade sand	377
10	Sandstone, very fine to fine-grained, light greenish gray, somewhat calcareous, containing a little muscovite	377 - 387
27	Sandstone, very fine-grained, light greenish gray, slightly calcareous, containing a little biotite and muscovite, with considerable interbedded gray shale	387 - 414
6	Shale, gray, with a little interbedded greenish-gray siltstone	414 - 420
19	Sandstone, very fine-grained, light gray, containing a little biotite and muscovite, with considerable interbedded gray shale; show of GAS, 420-427	420 - 439
25	Sandstone, fine-grained, poorly sorted, light gray, friable, with a little interbedded gray shale	439 - 464
	Canadaway group, 1413 feet	
21	Shale, gray, with some interbedded very fine-grained, light gray sandstone	464 - 485
15	Shale, gray, with a little interbedded very fine-grained, light gray sandstone	485 - 500
	Top of Clarendon sand	500
35	Sandstone, very fine to fine-grained, light greenish gray, containing a little muscovite, with some interbedded gray shale	500 - 535
17	Siltstone, greenish gray, containing a little biotite and muscovite, with considerable interbedded gray shale	535 - 552
32	Sandstone, very fine-grained, light greenish gray, containing a little biotite and muscovite, with some interbedded gray shale	552 - 584
	Bottom of Clarendon sand	584
29	Shale, greenish gray, silty, containing fragments of shells, with a little interbedded gray shale	584 - 613

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
32	Shale, gray to dark gray, with a little interbedded light gray siltstone	613 - 645
8	Siltstone, light gray	645 - 653
17	Shale, greenish gray, silty	653 - 670
28	Shale, greenish gray, silty, containing fragments of shells, with some interbedded gray shale	670 - 698
60	Shale, dark gray	698 - 758
26	Shale, greenish gray, silty, with considerable interbedded dark gray shale	758 - 784
26	Shale, dark gray, with a little interbedded greenish-gray siltstone	784 - 810
9	Shale, very dark gray, containing an occasional shell fragment, with a little interbedded greenish-gray siltstone	810 - 819
142	Shale, dark gray, with some interbedded greenish-gray siltstone containing fragments of shells; show of GAS at 900 feet and 927-935 which soon became exhausted	819 - 961
10	Sandstone, very fine-grained, light gray, containing a little biotite and muscovite, with considerable interbedded dark gray shale	961 - 971
33	Shale, gray to dark gray, containing some gray siltstone	971 - 1004
35	Shale, very dark gray, with some interbedded dark gray shale and a little gray siltstone	1004 - 1039
64	Shale, dark gray, with some interbedded gray siltstone containing some biotite	1039 - 1103
143	Shale, dark gray, with a little interbedded gray siltstone containing occasional fragments of shells; show of GAS at 1213 which soon became exhausted	1103 - 1246
45	Shale, dark gray, with some interbedded greenish-gray silty shale containing fragments of shells	1246 - 1291

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
34	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1291 - 1325
56	Shale, dark gray	1325 - 1381
14	Shale, greenish gray, silty, slightly calcareous, with some interbedded dark gray shale	1381 - 1395
84	Shale, dark gray, with a little interbedded greenish gray siltstone	1395 - 1479
30	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1479 - 1509
46	Shale, dark gray	1509 - 1555
10	Shale, dark greenish gray, silty	1555 - 1565
77	Shale, dark gray	1565 - 1642
16	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1642 - 1758
26	Shale, dark gray, in part silty	1758 - 1784
9	Shale, greenish gray, sandy, with some interbedded dark gray shale	1784 - 1793
25	Shale, dark gray with some interbedded very dark gray silty shale	1793 - 1818
	Top of Dunkirk shale	1818
20	Shale, grayish black, with a little interbedded greenish-gray silty shale	1818 - 1838
39	Shale, gray, with some interbedded greenish gray silty shale and a little grayish-black shale	1838 - 1877
	Bottom of Canadaway group	1877
95	Shale, gray to greenish gray, sandy, slightly calcareous, containing some muscovite and minute fragments of carbonized plant remains	1877 - 1972
8	Sandstone, very fine-grained, greenish gray, somewhat calcareous, with a little interbedded gray shale	1972 - 1980

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
19	Siltstone, grayish brown, containing some muscovite	1980 - 1999
56	Shale, greenish to dark greenish gray, sandy and silty, with some interbedded dark gray shale	1999 - 2055
46	Shale, dark gray, in part silty	2055 - 2101
19	Shale, greenish gray, sandy and silty, with a little interbedded very dark gray shale	2101 - 2120
31	Shale, dark gray	2120 - 2151
20	Shale, greenish gray, sandy, slightly calcareous, containing some muscovite, with a little interbedded dark gray shale	2151 - 2171
19	Shale, greenish gray silty, with considerable interbedded very dark gray shale	2171 - 2190
31	Shale, greenish gray, silty	2190 - 2221
16	Shale, greenish gray, sandy, containing some muscovite, with a little interbedded dark gray shale	2221 - 2237
50	Shale, dark gray, with a little interbedded greenish-gray, silty shale	2237 - 2287
12	Siltstone, light greenish gray, with considerable interbedded dark gray shale	2287 - 2299
5	Shale, dark gray	2299 - 2304
18	Shale, greenish gray, sandy, with considerable interbedded dark gray shale	2304 - 2322
21	Shale, dark grayish brown, silty, containing some muscovite, with some interbedded gray shale	2322 - 2343
19	Siltstone, dark grayish brown, containing some muscovite, with some interbedded dark gray shale	2343 - 2362
32	Shale, very dark grayish brown, silty, with a little interbedded dark gray shale	2362 - 2394
36	Shale, dark gray	2394 - 2430

Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Shale, very dark gray	2430 - 2439
58	Shale, grayish black	2439 - 2497
23	Shale, greenish gray, silty, with some interbedded gray shale; a little GAS at 2497-2520, which soon became exhausted	2497 - 2520
10	Shale, gray	2520 - 2530
20	Shale, dark gray, with a little interbedded grayish-black shale	2530 - 2550
63	Shale, grayish black, with considerable interbedded very dark gray shale	2550 - 2613
42	Shale, grayish black	2613 - 2655
83	Shale, grayish black, with a little interbedded gray shale	2655 - 2738
20	Shale, dark gray	2738 - 2758
31	Shale, grayish black, with some interbedded very dark gray shale	2758 - 2789
50	Shale, very dark gray, with a little interbedded grayish black shale	2789 - 2839
68	Shale, dark gray, with a little interbedded very dark gray shale	2839 - 2907
36	Shale, grayish black, with some interbedded very dark gray shale	2907 - 2943
31	Shale, grayish black	2943 - 2974
32	Shale, grayish black, with some interbedded dark gray, somewhat calcareous shale, containing an occasional shell fragment	2974 - 3006
20	Shale, dark to very dark gray, silty and somewhat clacareous, with some interbedded grayish-black shale	3006 - 3026
12	Shale, grayish black	3026 - 3038
38	Shale, very dark gray, somewhat calcareous	3038 - 3076
10	Shale, grayish black	3076 - 3086

Thickness Feet	Description of Strata	Depth in feet
39	Shale, very dark gray, somewhat calcareous	3086 - 3125
	Middle Devonian Series, 401 feet	
	Hamilton group, 319 feet	
23	Limestone, very fine, dense, brownish gray, argillaceous, containing a very little light brownish-gray chert, with considerable interbedded very dark gray, somewhat calcareous shale	3125 - 3148
72	Shale, very dark gray, calcareous, containing an occasional shell fragment	3148 - 3220
22	Shale, very dark gray, somewhat calcareous	3220 - 3242
20	Shale, grayish black	3242 - 3262
30	Shale, very dark gray, calcareous	3262 - 3292
14	Shale, grayish black, somewhat calcareous	3292 - 3306
74	Shale, very dark gray, calcareous	3306 - 3380
64	Shale, grayish black, somewhat calcareous	3380 - 3444
	Onondaga limestone, 82 feet	
30	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous, containing some black dense chert	3444 - 3474
2	Limestone, very fine, dense, dark brownish gray, argillaceous, containing some black dense, chert, with a very little interbedded grayish-brown bentonite	3474 - 3476
40	Limestone, very fine, dense, brownish to dark brownish gray, somewhat argillaceous, containing a great deal of light brownish-gray dense chert	3476 - 3516
4	Limestone, very fine, crystalline, brownish gray, containing a great deal of light brownish-gray dense chert	3516 - 3520
6	Limestone, very fine, dense, very dark brownish gray, argillaceous, containing some light brownish-gray dense chert	3520 - 3526

Thickness Feet	Description of Strata	Depth in feet
	Lower Devonian Series, 16+ feet	
	Oriskany sandstone, 12 feet	
2	Sandstone, fine to medium-grained, grayish brown, quartzose, calcareous; 2 1/2 bailers of SALT WATER in 1 1/2 hours at 3527	3526 - 3528
4	Sandstone, fine to medium-grained, light gray, quartzose, very slightly calcareous	3528 - 3532
6	Sandstone, fine to medium-grained, light gray, quartzose, somewhat calcareous	3532 - 3538
	Helderberg limestone, 4+ feet	
2	Limestone, very fine, dense, dark grayish brown	3538 - 3540
2	Limestone, very fine, dense, light grayish to grayish brown	3540 - 3542
	TOTAL DEPTH	3542

WELL-SAMPLE RECORD
NO.
11

WELL-SAMPLE RECORD

L. E. MALLORY AND SON NO. 1 WELL
APPALACHIAN DEVELOPMENT CORPORATION

McKean County, Pa., Corydon Township, Warrant 3704
Kinzua Quadrangle: 1.84 miles north of 41° 55' N. Lat. and 1.53 miles east of 78° 55' W. Long.
Completed: November 1943.
Elevation: 2090 feet above sea level.
Total depth: 4406 feet.
Deepest formation: Oriskany
Result: 30,000 cubic feet of gas per 24 hours, initial open flow from upper part of Oriskany sandstone; salt water at 4401 feet in Oriskany.
Samples: 635 to 4406 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4406+ feet	
	Upper Devonian Series, 4015+ feet	
	Conewango and Conneaut groups, 1245+ feet	
635	No samples	0 - 635
20	Shale, purplish gray, silty, containing some muscovite, with a great deal of interbedded greenish-gray silty shale	635 - 655
33	Shale, dark purplish gray, containing some muscovite, with a little interbedded dark gray shale	655 - 688
46	Shale, dark greenish gray, silty, containing some muscovite and occasional fragments of shells, with some interbedded dark purplish-gray shale	688 - 734
20	Shale, dark gray, with some interbedded purplish-gray silty shale and some greenish-gray siltstone containing occasional fragments of shells	734 - 754

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
7	Siltstone, greenish gray, containing some muscovite and occasional fragments of shells, with considerable interbedded dark gray shale	754 - 761
43	Shale, dark purplish gray, silty, containing some muscovite and occasional fragments of shells, with considerable interbedded dark gray shale	761 - 804
10	Shale, greenish gray, silty, containing some muscovite and an occasional shell fragment, with some interbedded purplish-gray shale	804 - 814
28	Shale, gray, with some interbedded greenish gray siltstone containing fragments of shells and a little purplish-gray silty shale	814 - 842
11	Shale, greenish gray, silty, containing some muscovite and a few minute fragments of carbonized plant remains, with some interbedded greenish-gray siltstone containing fragments of shells	842 - 853
54	Shale, dark purplish red, in part silty, containing fragments of shells, with a little interbedded greenish-gray siltstone, also fossiliferous	853 - 907
25	Shale, dark purplish gray, silty, containing some muscovite, with considerable interbedded greenish-gray silty shale containing occasional fragments of shells	907 - 932
	Bottom of "pink rock"	932
17	Shale, gray, with some interbedded greenish gray siltstone containing fragments of shells	932 - 949
11	Shale, gray, with a little interbedded dark purplish-gray silty shale containing an occasional shell fragment	949 - 960
53	Shale, dark gray	960 - 1013
68	Shale, dark gray, with a little interbedded greenish-gray silty shale containing fragments of shells	1013 - 1081
27	Shale, dark gray	1081 - 1108

.. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
42	Shale, dark gray, with a great deal of interbedded greenish-gray siltstone containing abundant fragments of shells	1108 - 1150
26	Shale, greenish gray, silty, with some interbedded greenish-gray siltstone containing fragments of shells and a little purplish-gray shale	1150 - 1176
9	Shale, gray, with some interbedded greenish-gray siltstone containing fragments of shells	1176 - 1185
16	Shale, gray, with a little interbedded very fine-grained, gray sandstone	1185 - 1201
34	Shale, gray, with a little interbedded slightly calcareous siltstone	1201 - 1235
10	Shale, gray, with considerable interbedded very fine-grained light gray to gray sandstone containing a little biotite and muscovite	1235 - 1245
	Canadaway group, 1405 feet	
31	Shale, gray to dark gray, with a little interbedded very fine-grained, light gray sandstone	1245 - 1276
29	Shale, dark gray, with considerable interbedded greenish-gray siltstone	1276 - 1305
	Top of Clarendon sand	1305
11	Sandstone, very fine to fine-grained, light gray, with considerable interbedded gray shale	1305 - 1316
12	Sandstone, very fine to fine grained, light gray, with some interbedded gray silty shale containing some biotite and muscovite	1316 - 1328
10	Shale, gray, with a little interbedded very fine-grained, light gray sandstone	1328 - 1338
9	Sandstone, very fine-grained, light gray, with considerable interbedded gray shale	1338 - 1347
10	Shale, gray, with a little interbedded very fine-grained, light gray sandstone	1347 - 1357

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
19	Sandstone, very fine-grained, light gray, containing a little biotite and muscovite, with considerable interbedded gray shale	1357 - 1376
	Bottom of Clarendon sand	1376
10	Siltstone, light greenish gray, containing a little biotite and muscovite and an occasional shell fragment, with some interbedded gray shale	1376 - 1386
28	Shale, gray	1386 - 1414
18	Shale, gray, with some interbedded very fine-grained light gray to gray sandstone containing a little biotite and muscovite	1414 - 1432
9	Shale, dark gray	1432 - 1441
37	Shale, gray, with some interbedded very fine-grained light greenish-gray sandstone, containing a little biotite and muscovite	1441 - 1478
36	Shale, dark gray	1478 - 1514
40	Shale, greenish gray, silty, containing fragments of shells, with a little interbedded dark gray shale	1514 - 1554
22	Shale, greenish and light brownish gray, silty, containing some biotite and muscovite, with a little interbedded dark gray shale	1554 - 1576
67	Shale, dark gray, with considerable interbedded greenish-gray, somewhat calcareous siltstone	1576 - 1643
16	Shale, dark gray	1643 - 1659
19	Shale, gray, silty, containing a little biotite and muscovite and an occasional shell fragment, with some interbedded dark gray shale	1659 - 1678
21	Siltstone, light gray, containing a little biotite and muscovite, with considerable interbedded gray shale	1678 - 1699
19	Sandstone, very fine-grained, light gray, containing a few quartz grains to 1 mm. in diameter, with considerable interbedded gray shale, Cooper sand	1699 - 1718

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
52	Shale, gray to dark gray, in part silty	1718 - 1770
19	Shale, dark gray	1770 - 1789
99	Shale, gray, with a little interbedded greenish-gray siltstone	1789 - 1888
62	Shale, dark gray, with some interbedded greenish-gray siltstone	1888 - 1950
120	Shale, gray to dark gray, with a little interbedded light gray siltstone	1950 - 2070
39	Shale, dark gray	2070 - 2109
8	Shale, greenish gray, silty	2109 - 2117
158	Shale, dark gray	2117 - 2275
21	Siltstone, greenish gray, with some interbedded dark gray shale	2275 - 2296
19	Shale, dark gray, with some interbedded greenish-gray siltstone	2296 - 2315
84	Shale, gray to dark gray	2315 - 2399
59	Shale, greenish gray, silty, with considerable interbedded dark gray shale	2399 - 2458
24	Shale, gray to dark gray, with some interbedded greenish-gray siltstone	2458 - 2482
36	Shale, greenish gray, silty, with considerable interbedded dark gray shale	2482 - 2518
12	Shale, gray to dark gray	2518 - 2530
60	Shale, greenish gray, silty, with some interbedded gray to dark gray shale	2530 - 2590
24	Shale, dark gray, with some interbedded very dark gray silty shale	2590 - 2614
36	Shale, grayish black, with considerable interbedded dark gray shale	2614 - 2650
	Bottom of Canadaway group	2650
70	Shale, greenish gray, silty, containing a little muscovite	2650 - 2720

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
27	Shale, dark gray, with considerable interbedded greenish-gray silty shale	2720 - 2747
38	Shale, greenish gray, silty, with some interbedded dark gray shale	2747 - 2785
21	Shale, greenish gray, silty and somewhat calcareous, with considerable interbedded dark gray shale	2785 - 2806
22	Shale, grayish black, somewhat calcareous, with a little interbedded greenish-gray silty shale	2806 - 2828
58	Shale, dark gray, in part silty	2828 - 2886
18	Shale, dark to very dark gray	2886 - 2904
23	Shale, dark greenish gray, silty	2904 - 2927
139	Shale, dark gray, with some interbedded greenish-gray silty shale	2927 - 3066
62	Shale, greenish gray, silty, with some interbedded dark gray shale	3066 - 3128
36	Shale, dark gray, with a little interbedded very dark gray shale	3128 - 3164
55	Shale, brownish to dark brownish gray, silty, containing some muscovite, with some interbedded dark gray shale	3164 - 3219
31	Shale, dark to very dark gray	3219 - 3250
14	Shale, grayish black, with considerable interbedded very dark gray shale	3250 - 3264
64	Shale, grayish black	3264 - 3328
11	Shale, greenish gray, silty, containing some muscovite, with some interbedded gray shale	3328 - 3339
32	Shale, gray to dark gray, with considerable interbedded greenish-gray silty shale containing some muscovite	3339 - 3371
22	Shale, very dark gray, with some interbedded grayish-black shale	3371 - 3393

Thickness Feet	Description of Strata	Depth in feet
22	Shale, dark to very dark gray	3393 - 3415
9	Shale, dark gray, with some interbedded grayish-black shale and some greenish-gray silty shale	3415 - 3424
21	Shale, very dark gray	3424 - 3445
52	Shale, very dark gray, with some interbedded grayish-black shale	3445 - 3497
26	Shale, very dark gray	3497 - 3523
120	Shale, grayish black, with considerable interbedded very dark gray shale	3523 - 3643
26	Shale, very dark gray, with some interbedded greenish-gray siltstone	3643 - 3669
24	Shale, grayish black, with considerable interbedded very dark gray shale	3669 - 3693
13	Shale, very dark gray	3693 - 3706
53	Shale, dark gray, very slightly calcareous	3706 - 3759
34	Shale, very dark gray	3759 - 3793
23	Shale, grayish black, with some interbedded very dark gray shale	3793 - 3816
69	Shale, grayish black	3816 - 3885
24	Shale, grayish black, with considerable interbedded very dark brownish-gray, slightly calcareous shale and a little very fine, dense, very dark brownish-gray limestone containing abundant Styolina shells	3885 - 3909
14	Shale, grayish black, with considerable interbedded dark gray slightly calcareous shale	3909 - 3923
26	Shale, dark gray, slightly calcareous, with some interbedded grayish-black shale	3923 - 3949
12	Shale, grayish black, in part slightly calcareous, with considerable interbedded dark gray shale	3949 - 3961
54	Shale, very dark gray, slightly calcareous	3961 - 4015

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description in Strata	Depth in feet
	Middle Devonian Series, 383 feet	
	Hamilton group, 308 feet	
6	Shale, very dark gray, with some interbedded very fine, dense, light brownish-gray, siliceous limestone, containing fragments of shells	4015 - 4021
6	Limestone, very fine, dense, light brownish to brownish gray, siliceous, containing a little brownish-gray dense chert and abundant fragments of shells, with a great deal of interbedded very dark gray, slightly calcareous shale	4021 - 4027
6	Shale, very dark gray, slightly calcareous, with considerable interbedded very fine, dense, light brownish to brownish-gray, siliceous limestone	4027 - 4033
40	Shale, very dark gray, calcareous	4033 - 4073
30	Shale, very dark gray, somewhat calcareous	4073 - 4103
97	Shale, grayish black, somewhat calcareous	4103 - 4200
11	Shale, grayish black, somewhat calcareous, with a little interbedded very fine, dense, very dark brownish-gray argillaceous limestone	4200 - 4211
75	Shale, grayish black, somewhat calcareous	4211 - 4286
37	Shale, grayish black, slightly calcareous, with a little interbedded very fine, dense, brownish-gray, argillaceous limestone	4286 - 4323
	Onondaga limestone, 75 feet	
24	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous, containing fragments of shells and some dark brownish-gray, dense chert	4323 - 4347
10	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous, containing fragments of shells and both black and light gray, dense chert	4347 - 4357

L. E. Mallory and Son No. 1 (Appalachian)

Thickness Feet	Description of Strata	Depth in feet
2	Limestone, very fine, dense, dark brownish gray, argillaceous, containing some light brownish-gray dense chert, with a little interbedded yellowish-brown metabentonite, containing biotite	4357 - 4359
37	Limestone, very fine, dense, brownish to dark brownish gray, containing a great deal of light brownish-gray dense chert	4359 - 4396
1	Limestone, very fine, crystalline, dark brownish gray, containing considerable light gray dense chert	4396 - 4397
1	Siltstone, dark to very dark gray, containing some fine to medium, well rounded and frosted quartz grains and a little glauconite	4397 - 4398
	Lower Devonian Series, 8+ feet	
	Oriskany sandstone, 8+ feet	
4	Sandstone, fine to medium-grained, light brownish gray, quartzose, slightly calcareous	4398 - 4403
3	Sandstone, fine-grained, light brownish gray, quartzose, slightly calcareous; 30,000 cubic feet of GAS per 24 hours, initial open flow from upper part of Oriskany, SALT WATER at 4401 feet	4403 - 4406
	TOTAL DEPTH	4406

WELL-SAMPLE RECORD

NO.

12

WELL-SAMPLE RECORD

E. A. WILLIAMS NO. 1 WELL
HIAWATHA OIL AND GAS COMPANY

McKean County, Pa., Foster Township, Warrant 4917
Kinzua Quadrangle: .54 mile south of 42° 00' N. Lat. and 1.19 miles west of 78° 45' W. Long.
Completed: October 12, 1940.
Elevation: 2082 feet above sea level.
Total depth: 4448 feet.
Deepest formation: Cobleskill limestone.
Result: Dry in Oriskany, no salt water.
Samples: 500 to 4438 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4431+ feet	
	Upper Devonian Series, 4018+ feet	
	Conewango and Conneaut groups, 1168+ feet	
500	No samples	0 - 500
9	Shale, greenish gray, with a little interbedded greenish-gray siltstone containing occasional fragments of shells	500 - 509
13	Shale, greenish gray, in part sandy, with a little interbedded purplish-gray sandy shale	509 - 522
71	Shale, dark purplish gray, sandy, with some interbedded greenish-gray shale, in part sandy, and some greenish-gray siltstone containing fragments of shells	522 - 593
21	Shale, dark greenish gray, sandy, with some interbedded dark greenish gray shale and a little dark purplish-gray shale	593 - 614
38	Shale, dark greenish gray, with some interbedded greenish-gray siltstone containing occasional fragments of shells	614 - 652

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, dark gray, with considerable interbedded greenish-gray siltstone	652 - 670
8	Shale, gray, with some interbedded very fine-grained greenish-gray sandstone containing fragments of shells	670 - 678
8	Shale, gray, with considerable interbedded greenish-gray siltstone containing fragments of shells	678 - 686
7	Shale, greenish gray, sandy	686 - 693
13	Shale, dark purplish red, with considerable interbedded gray shale and some greenish-gray siltstone containing fragments of shells	693 - 706
5	Sandstone, very fine-grained, greenish gray, containing fragments of shells	706 - 711
84	Shale, greenish gray, with some interbedded dark purplish-red shale and some greenish-gray siltstone containing fragments of shells	711 - 795
29	Shale, dark purplish gray, sandy, with considerable interbedded greenish-gray shale and some greenish-gray siltstone containing fragments of shells	795 - 824
34	Shale, dark purplish gray, in part sandy, with some interbedded greenish-gray sandy shale	824 - 858
5	Shale, dark purplish red, sandy	858 - 863
22	Shale, greenish gray, with some interbedded dark purplish-gray shale, in part sandy, and a little greenish-gray siltstone containing fragments of shells	863 - 885
	Bottom of "pink rock"	885
50	Shale, greenish gray	885 - 935
23	Shale, greenish gray, in part sandy	935 - 958
30	Shale, dark greenish gray, with a little interbedded greenish-gray sandy shale	958 - 988

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
110	Shale, greenish gray, with a little interbedded greenish-gray siltstone	988 - 1098
16	Shale, greenish gray, with considerable interbedded greenish-gray sandy shale containing occasional fragments of shells	1098 - 1114
44	Shale, greenish gray, with some interbedded very fine-grained, light greenish-gray somewhat calcareous sandstone	1114 - 1158
10	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing fragments of shells, with a great deal of interbedded greenish-gray shale, Glade sand	1158 - 1168
	Canadaway group, 1411 feet	
24	Shale, greenish gray, with considerable interbedded greenish-gray, slightly calcareous siltstone	1168 - 1192
	Top of Clarendon sand	1192
15	Sandstone, very fine-grained, greenish gray, somewhat calcareous, containing fragments of shells in upper part, with some interbedded greenish-gray shale	1192 - 1207
23	Sandstone, fine-grained, light greenish gray, slightly calcareous, with some interbedded greenish-gray shale	1207 - 1230
58	Sandstone, very fine to fine-grained, light greenish gray, with considerable interbedded greenish-gray shale	1230 - 1288
	Bottom of Clarendon sand	1288
33	Shale, gray, with considerable interbedded very fine-grained, light greenish-gray sandstone	1288 - 1321
62	Shale, dark greenish gray	1321 - 1383
18	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	1383 - 1401
7	Shale, dark greenish gray, with considerable interbedded very fine-grained, light greenish-gray sandstone	1401 - 1408

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Siltstone, light greenish gray, somewhat calcareous, with considerable interbedded greenish-gray shale	1408 - 1415
	Top of Bradford Second sand	1415
19	Sandstone, fine-grained, light brownish gray, somewhat calcareous, with considerable interbedded greenish-gray shale	1415 - 1434
55	Sandstone, very fine-grained, light brownish gray, somewhat calcareous, with some interbedded greenish-gray shale	1434 - 1489
27	Sandstone, very fine-grained, light brownish gray, somewhat calcareous, with considerable interbedded greenish-gray shale	1489 - 1516
	Bottom of Bradford Second sand	1516
37	Shale, dark greenish gray	1516 - 1553
20	Shale, greenish gray, in part sandy	1553 - 1573
5	Siltstone, greenish gray	1573 - 1578
49	Shale, gray, with a little interbedded very fine-grained, light greenish-gray sandstone	1578 - 1627
53	Siltstone, greenish gray, slightly calcareous, containing occasional fragments of shells, with some interbedded gray shale and a little very fine-grained, light greenish-gray sandstone	1627 - 1680
37	Shale, gray to greenish gray, with some interbedded greenish-gray siltstone containing occasional fragments of shells	1680 - 1717
18	Shale, dark gray	1717 - 1735
25	Shale, gray to greenish gray	1735 - 1760
130	Shale, gray to dark gray, with some interbedded greenish-gray siltstone	1760 - 1890
24	Shale, gray, with a little interbedded light chocolate-brown and greenish-gray siltstone	1890 - 1914
37	Shale, gray	1914 - 1951

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
3	Siltstone, gray	1951 - 1954
37	Shale, gray, with a little interbedded very fine-grained, light gray, somewhat calcareous sandstone	1954 - 1991
58	Shale, gray, with some interbedded gray siltstone	1991 - 2049
213	Shale, gray, with a little interbedded gray siltstone	2049 - 2262
11	Shale, gray, with considerable interbedded dark gray shale	2262 - 2273
45	Shale, gray, with a little interbedded gray, slightly calcareous siltstone	2273 - 2318
7	Shale, gray, with some interbedded very fine-grained, light gray, slightly calcareous sandstone	2318 - 2325
24	Shale, gray, with a little interbedded greenish-gray, slightly calcareous siltstone	2325 - 2349
83	Shale, gray, with considerable interbedded dark gray shale and some greenish-gray, slightly calcareous siltstone	2349 - 2432
17	Shale, dark gray, with some interbedded gray shale and considerable greenish-gray, slightly calcareous siltstone	2432 - 2449
41	Shale, greenish gray, sandy, with considerable interbedded dark gray shale	2449 - 2490
21	Siltstone, greenish gray, slightly calcareous, with some interbedded gray to dark gray shale	2490 - 2511
26	Shale, very dark gray, almost black, with considerable interbedded gray shale and some greenish-gray siltstone	2511 - 2537
18	Shale, very dark gray, almost black, with a great deal of interbedded gray shale	2537 - 2555
9	Shale, greenish gray, sandy, with some interbedded very dark gray shale	2555 - 2564

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Shale, greenish gray, sandy, with some interbedded gray to dark gray shale	2564 - 2573
6	Shale, greenish gray, sandy, with some interbedded very dark gray shale	2573 - 2579
	Bottom of Canadaway group	2579
8	Siltstone, greenish gray, somewhat calcareous, containing fragments of shells	2579 - 2587
25	Shale, gray, with some interbedded greenish-gray, somewhat calcareous siltstone	2587 - 2612
16	Sandstone, very fine-grained, greenish gray, somewhat calcareous, with some interbedded gray shale	2612 - 2628
58	Shale, gray, sandy, slightly calcareous	2628 - 2686
16	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing muscovite	2686 - 2702
17	Shale, dark gray, with some interbedded very fine-grained light greenish-gray, somewhat calcareous sandstone containing muscovite	2702 - 2719
18	Shale, grayish black, with considerable interbedded gray shale	2719 - 2737
8	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing muscovite	2737 - 2745
26	Shale, greenish gray, slightly calcareous, with some interbedded gray shale	2745 - 2771
6	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing muscovite	2771 - 2777
15	Shale, gray	2777 - 2791
8	Shale, greenish gray, sandy, somewhat calcareous	2791 - 2799
12	Shale, gray, with considerable interbedded very dark gray shale	2799 - 2811
42	Shale, gray, in part sandy, with some interbedded dark gray shale	2811 - 2853

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Shale, greenish gray, sandy and somewhat calcareous, with some interbedded very dark gray shale	2853 - 2862
23	Shale, gray, with some interbedded greenish-gray siltstone containing occasional fragments of shells	2862 - 2885
5	Siltstone, greenish gray, somewhat calcareous	2885 - 2890
30	Sandstone, very fine-grained, greenish gray, with considerable interbedded gray shale	2890 - 2920
26	Siltstone, greenish gray, slightly calcareous, containing occasional fragments of shells, with considerable interbedded gray shale	2920 - 2946
9	Sandstone, very fine-grained, greenish gray, with considerable interbedded gray shale	2946 - 2955
9	Siltstone, greenish gray, with considerable interbedded gray shale	2955 - 2964
8	Sandstone, very fine-grained, greenish gray, with some interbedded gray shale	2964 - 2972
15	Shale, dark gray, in part sandy, with some interbedded gray siltstone	2972 - 2987
75	Shale, gray, with considerable interbedded grayish-black shale and some greenish-gray siltstone	2987 - 3062
8	Shale, greenish to dark greenish gray, with considerable interbedded brownish-gray siltstone	3062 - 3070
8	Siltstone, greenish gray, with some interbedded gray shale	3070 - 3078
47	Shale, dark gray, with considerable interbedded brownish and greenish-gray siltstone	3078 - 3125
36	Shale, dark gray, with some interbedded grayish-black shale and some brownish-gray siltstone	3125 - 3161
10	Shale, dark gray, sandy, with considerable interbedded grayish-black shale	3161 - 3171

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
47	Shale, grayish black	3171 - 3218
22	Shale, grayish black, with some interbedded dark gray shale	3218 - 3240
40	Shale, dark gray, with considerable interbedded grayish-black shale	3240 - 3280
31	Shale, gray to dark gray, in part sandy	3280 - 3311
89	Shale, grayish black, with considerable interbedded dark gray shale	3311 - 3400
52	Shale, grayish black, with some interbedded dark gray shale	3400 - 3452
18	Shale, very dark gray, with considerable interbedded grayish-black shale	3452 - 3470
84	Shale, gray, with some interbedded grayish-black shale	3470 - 3554
40	Shale, dark gray, with a little interbedded grayish-black shale	3554 - 3594
20	Shale, grayish black, with some interbedded dark gray shale	3594 - 3614
43	Shale, dark to very dark gray	3614 - 3657
103	Shale, dark gray, in part slightly calcareous	3657 - 3760
31	Shale, dark gray, with a little interbedded grayish-black shale	3760 - 3791
22	Shale, grayish black, with considerable interbedded very dark gray shale	3791 - 3813
22	Shale, very dark gray, with some interbedded grayish-black shale	3813 - 3835
8	Shale, very dark gray	3835 - 3843
23	Shale, grayish black, in part somewhat calcareous	3843 - 3869
26	Shale, very dark gray	3869 - 3895
26	Shale, very dark gray, somewhat calcareous	3895 - 3921

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
31	Shale, very dark gray, somewhat calcareous with a little interbedded dark brownish-gray, silty limestone containing minute fragments of shells	3921 - 3952
23	Shale, very dark gray, almost black, somewhat calcareous	3952 - 3975
43	Shale, very dark gray, somewhat calcareous	3975 - 4018
	Middle Devonian Series, 398 feet	
	Hamilton group, 320 feet	
11	Shale, very dark gray, somewhat calcareous, with some interbedded very fine, dense, brownish-gray, argillaceous limestone	4018 - 4029
104	Shale, very dark gray, somewhat calcareous	4029 - 4133
35	Shale, very dark gray, almost black, somewhat calcareous	4133 - 4168
95	Shale, grayish black, somewhat calcareous	4168 - 4263
17	Shale, grayish black, somewhat calcareous, with a little interbedded very fine, dense, brownish-gray, argillaceous limestone	4263 - 4280
25	Shale, grayish black, calcareous	4280 - 4305
18	Shale, grayish black, somewhat calcareous, with a little interbedded very fine, dense, brownish-gray argillaceous limestone	4305 - 4323
15	Shale, black, somewhat calcareous	4323 - 4338
	Onondaga limestone, 78 feet	
15	Limestone, very fine, dense, very dark brownish gray, argillaceous, containing a very little light to dark brownish-gray chert	4338 - 4353
25	Limestone, very fine, dense, very dark brownish gray, argillaceous, containing some very dark brownish-gray, almost black, dense chert and an occasional shell fragment	4353 - 4378
19	Limestone, very fine, dense, brownish gray, siliceous, containing considerable light brownish-gray dense chert	4378 - 4397

E. A. Williams No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Limestone, very fine, dense, light brownish gray, siliceous, containing a great deal of light gray dense chert	4397 - 4414
2	Limestone, very fine, dense, dark brownish gray, siliceous, containing a little glauconite	4414 - 4416
	Lower Devonian Series, 15 feet	
	Oriskany sandstone, 15 feet	
7	Sandstone, medium-grained, light gray, quartzose, slightly calcareous; quartz grains mostly angular, but some are well rounded and frosted	4416 - 4423
6	Sandstone, fine to medium-grained, light gray, quartzose, slightly calcareous; quartz grains mostly angular, but a few are well rounded and frosted	4423 - 4429
2	Sandstone, fine-grained, light brownish gray, calcareous; no GAS or SALT WATER in Oriskany	4429 - 4431
	SILURIAN SYSTEM, 17+ feet	
	Upper Silurian or Cayugan Series, 17+ feet	
	Cobleskill limestone, 17+ feet	
7	Limestone, very fine, dense, brownish to very dark brownish gray, magnesian and somewhat argillaceous	4431 - 4438
10	No samples	4438 - 4448
	TOTAL DEPTH	4448

WELL-SAMPLE RECORD
NO.
13

WELL-SAMPLE RECORD

KINZUA VALLEY CHEMICAL COMPANY NO. 1 WELL
APPALACHIAN DEVELOPMENT CORPORATION

McKean County, Pa., Corydon Township, Warrant 3707
Kinzua Quadrangle: 1.45 miles south of 41° 55' N. Lat. and 1.53 miles east of 78° 55' W. Long.
Completed: May 1, 1943.
Elevation: 1358 feet above sea level.
Total depth: 3845 feet.
Deepest formation: Oriskany
Result: One and one-half barrels of salt water per hour from Oriskany.
Samples: 438 to 3845 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 3845+ feet	
	Upper Devonian Series, 3452+ feet	
	Conneaut and Canadaway groups, 2016+ feet	
438	No samples	0 - 438
30	Shale, gray	438 - 468
26	Siltstone, greenish gray, containing abundant fragments of shells, with considerable interbedded gray shale	468 - 494
17	Shale, dark purplish gray, with a little interbedded greenish-gray siltstone containing fragments of shells	494 - 511
8	Siltstone, greenish gray, containing fragments of shells, with considerable interbedded dark purplish-gray silty shale	511 - 519
18	Shale, greenish gray, silty, with some interbedded greenish-gray siltstone containing fragments of shells	519 - 537
7	Shale, dark purplish gray, silty, containing fragments of shells, with considerable interbedded greenish-gray siltstone	537 - 544

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
22	Shale, gray, with some interbedded light gray siltstone, containing fragments of shells	544 - 566
21	Shale, gray to dark gray	566 - 587
8	Shale, dark gray, with considerable interbedded greenish-gray siltstone	587 - 595
37	Shale, gray, with some interbedded gray siltstone, containing an occasional shell fragment	595 - 632
11	Shale, dark gray, with considerable interbedded greenish gray siltstone containing a little biotite and muscovite and some minute fragments of carbonized plant remains	632 - 643
37	Shale, gray, in part silty, with considerable interbedded greenish-gray siltstone	643 - 680
42	Sandstone, very fine to fine-grained, light gray, containing a few quartz grains to 1 mm. in diameter, with a great deal of interbedded gray shale, Clarendon sand	680 - 722
15	Shale, gray, with some interbedded greenish-gray siltstone and a little very fine-grained, light gray sandstone	722 - 737
14	Sandstone, very fine-grained, light gray, containing fragments of shells, with a great deal of interbedded gray shale	737 - 751
30	Shale, gray, with some interbedded greenish-gray siltstone	751 - 781
42	Shale, dark gray, with a little interbedded greenish-gray siltstone	781 - 823
20	Siltstone, greenish gray, containing some biotite and muscovite, with considerable interbedded dark gray shale	823 - 843
38	Shale, dark gray, with a little interbedded greenish-gray siltstone	843 - 881
60	Shale, dark gray, with considerable interbedded greenish-gray siltstone containing occasional fragments of shells	881 - 941

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
60	Shale, dark gray, with a little interbedded greenish-gray siltstone	941 - 1001
11	Shale, dark gray, with some interbedded greenish-gray siltstone and a little fine to medium-grained, light gray, somewhat calcareous sandstone	1001 - 1012
9	Shale, dark gray, with a little interbedded greenish-gray, slightly calcareous siltstone	1012 - 1021
10	Shale, dark gray, with considerable interbedded very fine-grained, light gray sandstone containing a little biotite and muscovite	1021 - 1031
53	Shale, gray, with considerable interbedded greenish-gray siltstone containing a little biotite and muscovite	1031 - 1084
30	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1084 - 1114
202	Shale, dark gray, with a little interbedded greenish gray siltstone containing occasional fragments of shells	1114 - 1316
25	Siltstone, greenish gray, with considerable interbedded dark gray shale	1316 - 1341
105	Shale, dark gray, with some interbedded greenish-gray siltstone	1341 - 1446
52	Shale, dark gray	1446 - 1498
106	Shale, dark gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing a little biotite and muscovite	1498 - 1604
11	Siltstone, greenish gray, with some interbedded dark gray silty shale	1604 - 1615
21	Shale, dark gray, with a little interbedded greenish-gray siltstone	1615 - 1636
82	Shale, dark gray, containing occasional minute spherical pyrite pellets	1636 - 1718

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
73	Shale, dark gray, with a little interbedded greenish-gray siltstone	1718 - 1791
21	Shale, greenish gray, silty, with some interbedded dark gray shale	1791 - 1812
18	Shale, gray to greenish gray, in part silty, with considerable interbedded very dark gray, almost black shale	1812 - 1830
11	Shale, gray, with some interbedded dark gray shale and a little greenish-gray siltstone	1830 - 1841
32	Siltstone, light greenish gray, containing some shell fragments, with a little interbedded dark gray shale	1841 - 1873
10	Shale, very dark gray, silty, with considerable interbedded gray shale	1873 - 1883
8	Siltstone, greenish gray, with considerable interbedded gray shale and a little very dark gray silty shale	1883 - 1891
20	Shale, greenish gray, silty, with some interbedded dark gray shale	1891 - 1911
6	Siltstone, greenish gray, containing a little biotite and muscovite, with considerable interbedded gray shale and a little very dark gray shale	1911 - 1917
40	Shale, greenish gray, silty, with some interbedded dark to very dark gray shale	1917 - 1957
21	Shale, dark gray, in part silty, with a little interbedded greenish-gray siltstone	1957 - 1978
17	Shale, greenish gray, silty, with some interbedded very dark gray shale	1978 - 1995
21	Shale, black, with some interbedded gray shale	1995 - 2016
	Bottom of Canadaway group	2016
146	Shale, greenish gray, sandy and silty, containing some muscovite with a little interbedded dark gray shale	2016 - 2162

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Sandstone, very fine-grained, light greenish gray, containing some muscovite, with some interbedded gray shale	2162 - 2171
11	Shale, dark gray, with a little interbedded greenish-gray silty shale	2171 - 2182
17	Shale, dark gray, with considerable interbedded grayish-black shale	2182 - 2199
85	Shale, dark greenish gray, silty, with some interbedded dark to very dark gray shale	2199 - 2284
32	Siltstone, greenish gray, containing some muscovite, with a little interbedded dark gray shale	2284 - 2316
38	Shale, greenish gray, silty, with some interbedded dark to very dark gray shale	2316 - 2354
23	Shale, greenish gray, silty, with a little interbedded grayish-black shale	2354 - 2377
22	Siltstone, greenish gray, containing some muscovite, with some interbedded gray to dark gray shale	2377 - 2399
31	Shale, dark greenish gray, silty, with some interbedded dark gray shale	2399 - 2430
13	Siltstone, greenish gray, containing some muscovite, with some interbedded dark gray shale	2430 - 2443
20	Shale, greenish to dark greenish gray, silty, containing some muscovite	2443 - 2463
26	Shale, dark gray	2463 - 2489
14	Siltstone, greenish gray, with some interbedded gray shale	2489 - 2503
18	Shale, dark gray, with a little interbedded grayish-black shale	2503 - 2521
15	Shale, dark gray, with some interbedded greenish-gray silty shale	2521 - 2536
35	Shale, brownish gray, silty, containing some muscovite, with some interbedded gray to dark gray shale	2536 - 2571

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Shale, greenish gray, silty, with some interbedded dark gray shale	2571 - 2582
20	Shale, dark to very dark gray	2582 - 2602
23	Shale, dark gray, with some interbedded grayish-black shale	2602 - 2625
16	Shale, dark to very dark gray	2625 - 2641
31	Shale, grayish black, with some interbedded dark gray shale	2641 - 2672
52	Shale, grayish black	2672 - 2724
87	Shale, gray to dark gray, in part silty, with a little interbedded greenish-gray siltstone	2724 - 2811
12	Shale, very dark gray, with considerable interbedded greenish-gray silty shale	2811 - 2823
190	Shale, grayish black, with some interbedded dark to very dark gray shale	2823 - 3013
35	Shale, dark gray	3013 - 3048
82	Shale, grayish black, with a little interbedded dark gray shale	3048 - 3130
27	Shale, very dark gray, with a little interbedded grayish-black shale	3130 - 3157
30	Shale, dark gray, very slightly calcareous	3157 - 3187
33	Shale, very dark gray, very slightly calcareous	3187 - 3220
38	Shale, grayish black, with a little interbedded dark gray shale	3220 - 3258
50	Shale, grayish black	3258 - 3308
24	Shale, very dark gray, with a little interbedded grayish-black shale	3308 - 3332
22	Shale, grayish black, slightly calcareous	3332 - 3354
10	Shale, grayish black, slightly calcareous, with a little interbedded, very fine, dense, very dark brownish-gray, argillaceous limestone	3354 - 3364

inzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
23	Shale, grayish black, somewhat calcareous	3364 - 3387
22	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black shale	3387 - 3409
43	Shale, very dark gray, somewhat calcareous	3409 - 3452
	Middle Devonian Series, 383 feet	
	Hamilton group, 318 feet	
26	Shale, very dark gray, somewhat calcareous, with some interbedded, very fine, dense, brownish-gray, argillaceous limestone	3452 - 3478
23	Shale, very dark gray, somewhat calcareous, containing a few shell fragments	3478 - 3491
4	Shale, grayish black, somewhat calcareous	3491 - 3495
52	Shale, very dark gray, slightly calcareous	3495 - 3547
66	Shale, grayish black, calcareous	3547 - 3613
19	Shale, grayish black, somewhat calcareous, with some interbedded very dark gray shale	3613 - 3632
4	Shale, very dark gray to grayish black, calcareous, containing an occasional shell fragment	3632 - 3636
18	Shale, very dark gray, calcareous	3636 - 3654
31	Shale, grayish black, calcareous	3654 - 3685
85	Shale, black, in part slightly calcareous	3685 - 3770
	Onondaga limestone, 65 feet	
24	Limestone, very fine, dense, very dark brownish gray, almost black, argillaceous, containing abundant fragments of shells and a little black dense chert	3770 - 3794
12	Limestone, very fine, dense, very dark brownish gray, almost black, argillaceous, containing fragments of shells and considerable black dense chert	3794 - 3806

Kinzua Valley Chemical Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Limestone, very fine, dense, brownish gray, siliceous, containing a great deal of light brownish-gray dense chert and a little interbedded light brownish-gray metabentonite containing biotite	3806 - 3817
3	Limestone, very fine, dense, brownish gray, siliceous, containing a great deal of light brownish-gray dense chert	3817 - 3820
3	Limestone, very fine, dense, brownish gray, siliceous, containing a great deal of light brownish-gray dense chert and a little interbedded light brownish-gray metabentonite containing considerable biotite	3820 - 3823
12	Limestone, very fine, dense, brownish gray, siliceous, containing a great deal of light brownish-gray, dense chert	3823 - 3835
	Lower Devonian Series, 10+ feet	
	Oriskany sandstone, 10+ feet	
2	Sandstone, fine to medium-grained, light gray, quartzose, calcareous	3835 - 3837
2	Sandstone, fine-grained, light gray, quartzose, slightly calcareous	3837 - 3839
6	Sandstone, fine-grained, light gray, quartzose, very slightly calcareous; 1 1/2 barrels of SALT WATER per hour from Oriskany	3839 - 3845
	TOTAL DEPTH	3845

WELL-SAMPLE RECORD

NO.

14

WELL-SAMPLE RECORD

L. E. MALLORY AND SON NO. 1 WELL
HIAWATHA OIL AND GAS COMPANY

McKean County, Pa., Corydon Township, Warrant 3705
Kinzua Quadrangle: 2.60 miles north of 41° 50' N. Lat. and .50 mile west of 78° 50' W. Long.
Completed: April 19, 1940.
Elevation: 1603 feet above sea level
Total depth: 4241 feet
Deepest formation: Oriskany
Result: 150,000 cubic feet of gas per day accompanied by salt water at 4187 to 4190 feet in Onondaga. Salt water rose 300 feet in 2 hours, but was exhausted by bailing. Salt water encountered at 4234 feet in Oriskany ran over top of casing and could not be bailed off.
Samples: 905 to 998 feet and 1103 to 4241 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4241+ feet	
	Upper Devonian Series, 3795+ feet	
	Conewango, Conneaut and Canadaway groups, 2347+ feet	
905	No samples	0 - 905
	Top of Clarendon sand	905
43	Sandstone, fine to medium-grained, light greenish gray	905 - 948
8	Sandstone, fine to medium-grained, light greenish gray, with a little interbedded greenish-gray shale	948 - 956
25	Sandstone, fine to medium-grained, light greenish gray	956 - 981
17	Sandstone, fine to medium-grained, light greenish gray, with a little interbedded greenish-gray shale	981 - 998
	Bottom of Clarendon sand	998

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Thickness Feet	Description of Strata	Depth in feet
105	No samples	998 - 1103
30	Shale, greenish gray, with a little interbedded greenish-gray sandy shale	1103 - 1133
162	Shale, greenish gray, with a little interbedded greenish-gray siltstone	1133 - 1295
25	Sandstone, very fine-grained, grayish brown, with a little interbedded greenish-gray shale, Cooper sand	1295 - 1320
7	Siltstone, brownish gray	1320 - 1327
8	Shale, dark gray, with considerable interbedded brownish and greenish-gray siltstone	1327 - 1335
37	Shale, dark gray, with a little interbedded greenish-gray siltstone	1335 - 1372
6	Shale, greenish gray, sandy	1372 - 1378
112	Shale, dark gray, with some interbedded greenish gray siltstone, containing fragments of shells	1378 - 1490
7	Shale, greenish gray	1490 - 1497
16	Shale, dark gray, with considerable interbedded greenish-gray siltstone	1497 - 1513
28	Shale, dark gray, with some interbedded greenish-gray siltstone	1513 - 1541
64	Shale, greenish gray	1541 - 1605
103	Shale, gray, with a little interbedded light greenish-gray, slightly calcareous siltstone, containing fragments of shells	1605 - 1708
34	Shale, dark gray, with some interbedded dark grayish-brown siltstone	1708 - 1742
16	Shale, dark gray, with considerable interbedded greenish-gray, slightly calcareous siltstone	1742 - 1758
8	Siltstone, greenish and brownish gray, slightly calcareous	1758 - 1766
174	Shale, gray, with a little interbedded greenish-gray siltstone	1766 - 1940

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hickness Feet	Description of Strata	Depth in feet
42	Shale, dark gray, with some interbedded greenish-gray siltstone	1940 - 1982
66	Shale, gray, with a little interbedded greenish-gray siltstone	1982 - 2048
23	Shale, greenish gray	2048 - 2071
47	Shale, gray, with considerable interbedded greenish-gray siltstone	2071 - 2118
32	Shale, gray to dark gray, with a little interbedded greenish-gray siltstone	2118 - 2150
28	Shale, very dark gray, with some interbedded greenish-gray siltstone	2150 - 2178
27	Siltstone, greenish gray, with considerable interbedded very dark gray shale	2178 - 2205
35	Shale, gray to dark gray	2205 - 2240
7	Shale, very dark gray	2240 - 2247
7	Siltstone, greenish gray, slightly calcareous	2247 - 2254
7	Shale, grayish black, with considerable interbedded gray shale	2254 - 2261
7	Siltstone, greenish gray	2261 - 2268
26	Shale, grayish black, with considerable interbedded gray shale	2268 - 2294
9	Shale, gray, with considerable interbedded grayish-black shale	2294 - 2303
9	Shale, grayish black, with considerable interbedded gray shale	2303 - 2312
18	Shale, gray with considerable interbedded grayish-black shale	2312 - 2330
17	Shale, gray to very dark gray	2330 - 2347
	Bottom of Canadaway group	2347
22	No samples	2347 - 2369
9	Siltstone, greenish gray, slightly calcareous	2369 - 2378

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Thickness Feet	Description of Strata	Depth in feet
26	Sandstone, very fine-grained, greenish gray, with a little interbedded greenish-gray sandy shale	2378 - 2404
26	Siltstone, greenish gray, slightly calcareous, with a little interbedded gray shale	2404 - 2430
53	Siltstone, greenish gray, with some interbedded greenish-gray shale	2430 - 2483
32	Siltstone, greenish gray, slightly calcareous, with some interbedded grayish black shale	2483 - 2515
35	Shale, dark gray, with considerable interbedded greenish-gray, slightly calcareous siltstone	2515 - 2550
10	Sandstone, very fine-grained, slightly calcareous, with some interbedded dark gray shale	2550 - 2560
10	Shale, dark gray	2560 - 2570
28	Siltstone, greenish gray, slightly calcareous, with some interbedded dark gray shale	2570 - 2598
16	Shale, gray to dark gray, with a little interbedded greenish-gray siltstone	2598 - 2614
8	Sandstone, very fine-grained, greenish gray, with considerable interbedded dark gray shale	2614 - 2622
21	Siltstone, greenish gray, with some interbedded dark gray shale	2622 - 2643
60	Shale, greenish gray, sandy	2643 - 2703
38	Shale, dark gray, with a little interbedded greenish-gray siltstone	2703 - 2741
17	Siltstone, greenish gray, with some interbedded dark gray shale	2741 - 2758
55	Shale, dark gray, with some interbedded greenish-gray siltstone	2758 - 2813
44	Shale, dark to very dark gray	2813 - 2857
73	Shale, dark gray, with some interbedded greenish-gray siltstone	2857 - 2930

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Thickness Feet	Description of Strata	Depth in feet
14	Shale, grayish black	2930 - 2944
7	Shale, very dark gray	2944 - 2951
7	Shale, grayish black	2951 - 2958
75	Shale, very dark gray	2958 - 3033
20	Siltstone, brownish and greenish gray, with a little interbedded very dark gray shale	3033 - 3053
15	Shale, dark gray, with some interbedded grayish-brown siltstone	3053 - 3068
65	Shale, gray	3068 - 3133
27	Siltstone, grayish brown, with considerable interbedded grayish-black shale	3133 - 3160
28	Shale, grayish black, with considerable interbedded grayish-brown siltstone	3160 - 3188
85	Shale, very dark gray	3188 - 3273
62	Shale, dark to very dark gray	3273 - 3335
31	Shale, gray	3335 - 3366
88	Shale, very dark gray, with considerable interbedded gray shale	3366 - 3454
26	Shale, dark gray, slightly calcareous	3454 - 3480
21	Shale, gray, somewhat calcareous	3480 - 3501
9	Shale, gray, slightly calcareous, with a very little interbedded dense brownish-gray limestone, containing fragments of shells	3501 - 3510
27	Shale, gray, slightly calcareous	3510 - 3537
82	Shale, dark to very dark gray	3537 - 3619
46	Shale, very dark brownish gray	3619 - 3665
101	Shale, very dark brownish gray, somewhat calcareous	3665 - 3766
29	Shale, very dark gray, calcareous	3766 - 3795

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Thickness Feet	Description of Strata	Depth in feet
	Middle Devonian Series, 436 feet	
	Hamilton group, 371 feet	
7	Limestone, dense, brownish gray, with considerable interbedded dark gray, somewhat calcareous shale--insoluble residue from limestone contains molds of micro-fossils	3795 - 3802
10	Shale, dark gray, calcareous, containing fragments of shells	3802 - 3812
14	Shale, dark gray, calcareous	3812 - 3826
32	Shale, dark gray, somewhat calcareous	3826 - 3858
40	Shale, very dark gray, somewhat calcareous	3858 - 3898
16	Shale, dark gray, somewhat calcareous	3898 - 3914
70	Shale, very dark gray, calcareous	3914 - 3984
38	Shale, very dark brownish gray, very calcareous	3984 - 4022
20	Shale, brownish black, somewhat calcareous	4022 - 4042
30	Shale, brownish black, slightly calcareous	4042 - 4072
38	Shale, brownish black, somewhat calcareous	4072 - 4110
56	Shale, black, somewhat calcareous	4110 - 4166
	Onondaga limestone, 65 feet	
16	Limestone, dense, brownish to very dark brownish gray, argillaceous	4166 - 4182
5	Limestone, dense, very dark brownish gray, argillaceous, containing a little very dark almost black chert	4182 - 4187
3	Limestone, dense, very dark brownish gray, argillaceous, containing a little very dark almost black chert and fragments of shells; 150,000 cubic feet of GAS accompanied by SALT WATER encountered in this interval; salt water rose 300 feet in hole, but was exhausted by bailing	4187 - 4190

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Thickness Feet	Description of Strata	Depth in feet
16	Limestone, dense, dark brownish gray, argillaceous, containing some dark brownish-gray to almost black chert	4190 - 4206
7	Limestone, dense, light brownish gray, silty and argillaceous	4206 - 4213
7	Limestone, dense, light brownish gray, containing a great deal of light brownish-gray chert	4213 - 4220
11	Limestone, dense, brownish gray, containing a great deal of light brownish-gray chert	4220 - 4231
	Lower Devonian Series, 10+ feet	
	Oriskany sandstone, 10+ feet	
1	Sandstone, medium-grained, brownish gray, calcareous	4231 - 4232
9	Sandstone, medium-grained, light gray to white, slightly calcareous; SALT WATER ran over top of casing, could not be bailed off	4232 - 4241
	TOTAL DEPTH	4241

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

WARRANT 3416 NO. 4 WELL
SOUTH PENN OIL COMPANY

McKean County, Pa., Lafayette Township, Warrant 3416
Kinzua Quadrangle: 2.18 miles north of 41° 50' N. Lat. and .89 mile west of 78° 45' W. Long.
Completed: February 21, 1944.
Elevation: 2137 feet above sea level.
Total depth: 4898 feet.
Deepest formation: Oriskany sandstone.
Result: One bailer of salt water per hour from Oriskany.
Samples: 0 to 4680 feet and 4833 to 4898 feet examined by Chas R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	PENNSYLVANIAN SYSTEM, 75+ feet	
	Upper Pottsville-Kanawha Series, 75+ feet	
	Olean conglomerate, 75+ feet	
30	Sandstone, very coarse, conglomeratic, light yellowish brown, containing subangular quartz pebbles up to one centimeter in diameter	0 - 30
15	Sandstone, very coarse-grained, light yellowish brown, containing subangular quartz pebbles up to 4 millimeters in diameter	30 - 45
	Bottom of weathered zone	45
30	Sandstone, fine to medium-grained, light greenish gray, containing some rounded quartz pebbles up to 5 millimeters in diameter, WATER encountered at 75 feet	45 - 75
	MISSISSIPPIAN SYSTEM, 129 feet	
	Pocono group, 129 feet	
	Knapp formation, 129 feet	
13	Shale, gray, with some interbedded, fine-grained, light greenish gray, slightly calcareous sandstone	75 - 88

Thickness Feet	Description of Strata	Depth in feet
3	Sandstone, medium-grained, light gray, containing occasional discoidal quartz pebbles up to 12 millimeters in diameter	88 - 91
17	Sandstone, very fine to fine-grained, light greenish gray, containing a little muscovite and occasional subrounded quartz grains up to 3 millimeters in diameter	91 - 108
10	Sandstone, very fine to fine-grained, light greenish gray, containing occasional subrounded quartz grains up to 4 millimeters in diameter, with some interbedded gray shale	108 - 118
10	Shale, gray, silty, with some interbedded very fine-grained, light greenish-gray sandstone	118 - 128
13	Sandstone, very fine to fine-grained, light greenish gray, containing a few subrounded quartz grains up to 3 millimeters in diameter and occasional fragments of shells, with some interbedded gray shale	128 - 141
16	Shale, dark gray, with a little interbedded very fine-grained, light gray to greenish-gray sandstone containing occasional fragments of shells	141 - 157
19	Sandstone, very fine to fine-grained, light greenish gray, slightly calcareous, containing some biotite and muscovite mica and subrounded quartz grains up to 5 millimeters in diameter, with some interbedded greenish-gray sandy shale	157 - 176
7	Sandstone, very coarse, conglomeratic, light gray, containing numerous subrounded to rounded quartz pebbles up to 3 millimeters in diameter	176 - 183
21	Sandstone, fine-grained, light gray, containing occasional discoidal quartz pebbles up to 8 millimeters in diameter, with a little interbedded dark gray shale	183 - 204

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4694+ feet	
	Upper Devonian Series, 4263 feet	
	Conewango group, 492 feet	
	Oswayo formation, 188 feet	
11	Shale, dark greenish gray, silty	204 - 215
16	Shale, dark greenish gray, with considerable interbedded very fine-grained, light greenish-gray sandstone containing occasional subrounded to rounded quartz pebbles up to 5 millimeters in diameter	215 - 231
41	Shale, greenish gray, sandy, containing some muscovite and minute carbonized plant fragments	231 - 272
10	Shale, gray, silty, containing minute fragments of carbonized plant remains, with considerable interbedded very fine-grained, light greenish-gray sandstone	272 - 282
29	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing a little biotite and muscovite and minute fragments of carbonized plant remains, with some interbedded dark gray shale	282 - 311
19	Shale, dark greenish gray, sandy, containing minute fragments of carbonized plant remains and occasional shell fragments	311 - 330
34	Sandstone, very fine-grained, light greenish gray, containing a little biotite and muscovite and some minute fragments of carbonized plant remains, with considerable interbedded greenish-gray silty shale	330 - 364
28	Shale, greenish gray, silty, with considerable interbedded very fine-grained light greenish-gray sandstone like above	364 - 392
	Cattaraugus formation, 304 feet	
12	Shale, brick red, silty, with a little interbedded grayish green, slightly calcareous, silty shale	392 - 404

Thickness Feet	Description of Strata	Depth in feet
4	Siltstone, grayish green, containing some muscovite	404 - 408
28	Sandstone, very fine-grained, light grayish green, slightly calcareous, containing a little biotite and muscovite and some minute fragments of carbonized plant remains	408 - 436
33	Shale, greenish gray, silty, containing minute fragments of carbonized plant remains, with some interbedded very fine-grained light greenish-gray sandstone and brick-red silty shale	436 - 469
15	Shale, brick red, silty, with considerable interbedded grayish-green, slightly calcareous siltstone and some greenish-gray shale	469 - 484
5	Sandstone, very fine-grained, light greenish gray	484 - 489
12	Shale, brick red, silty, with some interbedded greenish-gray shale and siltstone	489 - 501
12	Shale, greenish gray, silty, with a great deal of interbedded brick-red shale	501 - 513
21	Siltstone, grayish green, containing some muscovite and minute fragments of carbonized plant remains	513 - 534
102	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone containing occasional fragments of shells	534 - 636
19	Sandstone, very fine to fine-grained, light gray, containing some biotite and muscovite mica and minute fragments of carbonized plant remains, with some interbedded dark gray shale	636 - 655
41	Shale, brick red, silty, with a little interbedded grayish-green silty shale	655 - 696
	Conneaut group, 692 feet	
73	Shale, dark greenish gray, in part silty, containing fragments of shells	696 - 769
19	Shale, dark greenish gray, in part silty, with considerable interbedded greenish-gray siltstone	769 - 788

Thickness Feet	Description of Strata	Depth in feet
	Top of "pink rock"	788
13	Shale, dark greenish gray, silty, containing muscovite, with some interbedded dark purplish-gray shale	788 - 801
33	Shale, dark greenish gray, silty, containing muscovite, with a little interbedded dark purplish-gray shale and greenish-gray siltstone containing fragments of shells	801 - 834
45	Shale, dark greenish gray, silty, containing minute fragments of carbonized plant remains and shell fragments, with some interbedded dark purplish-gray silty shale	834 - 879
31	Shale, dark greenish gray, silty, containing fragments of shells, including crinoid stems, with some interbedded dark gray shale	879 - 910
25	Siltstone, greenish gray, containing fragments of shells, with some interbedded dark gray shale	910 - 935
35	Shale, dark greenish gray, silty, with considerable interbedded greenish gray siltstone containing fragments of shells	935 - 970
20	Shale, dark greenish gray, silty, with some interbedded dark purplish-gray shale	970 - 990
25	Shale, dark gray, with considerable interbedded greenish-gray siltstone containing fragments of shells	990 - 1015
85	Shale, dark purplish gray, in part silty, with some interbedded dark greenish-gray silty shale and greenish-gray siltstone containing fragments of shells	1015 - 1100
8	Siltstone, greenish gray, containing muscovite, with some interbedded dark gray shale	1100 - 1108
27	Shale, greenish gray, silty, containing muscovite and fragments of shells with considerable interbedded dark purplish-gray silty shale	1108 - 1135
	Bottom of "pink rock"	1135

Thickness Feet	Description of Strata	Depth in feet
15	Shale, greenish gray, with some interbedded greenish-gray siltstone containing fragments of shells	1135 - 1150
12	Sandstone, very fine-grained, light greenish gray, containing some muscovite, with some interbedded gray shale; First Warren sand	1150 - 1162
28	Shale, greenish gray, in part silty, containing some biotite	1162 - 1190
37	Shale, gray, with some interbedded greenish gray siltstone containing fragments of shells	1190 - 1227
6	Siltstone, greenish gray	1227 - 1233
19	Shale, gray, in part silty, containing fragments of shells	1233 - 1252
51	Shale, gray, with some interbedded very fine-grained, light gray sandstone containing fragments of shells	1252 - 1303
8	Shale, greenish gray, silty, containing fragments of shells, with some interbedded gray shale	1303 - 1311
18	Shale, greenish gray, silty, containing fragments of shells, with some interbedded dark purplish-gray silty shale	1311 - 1329
25	Shale, greenish gray, silty, containing fragments of shells	1329 - 1354
	Top of Bradford First sand	1354
10	Sandstone, very fine-grained, light greenish gray, slightly calcareous, containing fragments of shells, with a little interbedded gray shale	1354 - 1364
24	Sandstone, very fine-grained, light greenish gray, slightly calcareous, containing fragments of shells	1364 - 1388
	Bottom of Bradford First sand	1388
	Canadaway group, 1492 feet	
37	Shale, greenish gray	1388 - 1425

Thickness Feet	Description of Strata	Depth in feet
6	Shale, greenish gray, silty, containing fragments of shells	1425 - 1431
5	Sandstone, medium to coarse-grained, light gray, containing subrounded to rounded quartz grains up to 2 millimeters in diameter; Watsonville sand	1431 - 1436
37	Shale, gray, with some interbedded greenish-gray siltstone	1436 - 1473
24	Shale, gray, with some interbedded very fine-grained, light greenish-gray sandstone containing a little biotite and muscovite	1473 - 1497
20	Sandstone, very fine-grained, light greenish gray, containing a little muscovite, with some interbedded gray shale; Dew Drop sand	1497 - 1517
20	Shale, gray, with a little interbedded very fine-grained, light gray to gray sandstone containing some biotite and muscovite	1517 - 1537
25	Shale, gray, in part silty	1537 - 1562
18	Shale, gray, with considerable interbedded greenish-gray siltstone containing some biotite and muscovite	1562 - 1580
68	Shale, gray, in part silty	1580 - 1648
	Top of Bradford Second sand	1648
17	Sandstone, very fine-grained, light gray, slightly calcareous, containing some muscovite, with considerable interbedded dark gray shale	1648 - 1665
7	Shale, gray	1665 - 1672
13	Sandstone, very fine to fine-grained, light grayish brown, slightly calcareous, containing some muscovite and occasional subrounded to rounded quartz grains up to 2 millimeters in diameter, with a little interbedded gray shale	1672 - 1685
	Bottom of Bradford Second sand	1685
59	Shale, gray, with a little interbedded greenish gray, slightly calcareous siltstone	1685 - 1744

Thickness Feet	Description of Strata	Depth in feet
21	Shale, gray, with a little interbedded very fine-grained, light gray, slightly calcareous sandstone	1744 - 1765
15	Shale, gray, with a little interbedded greenish-gray siltstone	1765 - 1780
	Top of Cooper sand	1780
20	Sandstone, very fine-grained, light gray, containing a little biotite and muscovite with considerable interbedded gray shale	1780 - 1800
10	Sandstone, very fine-grained, light gray, containing a little biotite and muscovite, with some interbedded gray shale	1800 - 1810
16	Shale, gray, with considerable interbedded very fine-grained, light gray to grayish-brown sandstone	1810 - 1826
	Bottom of Cooper sand	1826
29	Shale, gray, with considerable interbedded greenish-gray siltstone, containing some biotite and muscovite and fragments of shells	1826 - 1855
44	Shale, greenish gray, in part silty, containing fragments of shells	1855 - 1899
47	Shale, gray, with a little interbedded greenish-gray siltstone containing minute fragments of carbonized plant remains	1899 - 1946
29	Shale, greenish gray, silty, with considerable interbedded dark gray shale	1946 - 1975
6	Siltstone, greenish gray, somewhat calcareous, containing fragments of shells	1975 - 1981
7	Shale, gray, with some interbedded grayish-brown siltstone	1981 - 1988
	Top of Bradford Third sand	1988
10	Sandstone, very fine-grained, grayish brown, with a great deal of interbedded greenish-gray shale	1988 - 1998
12	Sandstone, very fine-grained, grayish brown, containing a little biotite and muscovite	1998 - 2010

Thickness Feet	Description of Strata	Depth in feet
7	Shale, gray, with considerable interbedded very fine-grained grayish-brown sandstone and some greenish-gray siltstone	2010 - 2017
24	Sandstone, very fine-grained, grayish brown, containing a little muscovite, with considerable interbedded gray shale	2017 - 2041
	Bottom of Bradford Third sand	2041
65	Shale, greenish gray, in part silty, with a little interbedded dark grayish-brown siltstone	2041 - 2106
36	Shale, greenish gray, with a little interbedded greenish-gray siltstone	2106 - 2142
27	Shale, gray, with a little interbedded greenish-gray and brownish-gray siltstone	2142 - 2169
26	Shale, gray, with some interbedded very fine-grained, light gray, somewhat calcareous sandstone containing a little biotite	2169 - 2195
29	Shale, gray, with a little interbedded light gray siltstone containing occasional shell fragments	2195 - 2224
147	Shale, gray to dark gray, silty, with a little interbedded light gray siltstone containing an occasional shell fragment	2224 - 2371
64	Shale, gray, with a little interbedded light gray siltstone	2371 - 2435
39	Shale, gray to dark gray, with considerable interbedded dark gray silty shale and a little light gray siltstone containing a little biotite and muscovite	2435 - 2474
48	Shale, dark gray, with a little interbedded light gray siltstone containing a little biotite and muscovite	2474 - 2522
28	Shale, dark gray, in part silty, with a little interbedded gray siltstone	2522 - 2550
84	Shale, dark gray, in part silty	2550 - 2634
20	Shale, gray, with some interbedded dark gray silty shale	2634 - 2654

Thickness Feet	Description of Strata	Depth in feet
46	Shale, gray to dark gray, silty and micaceous	2654 - 2700
11	Siltstone, greenish gray, micaceous	2700 - 2711
22	Shale, grayish black, silty, with considerable interbedded greenish gray silty and micaceous shale	2711 - 2733
22	Shale, gray, silty and micaceous, with some interbedded grayish-black silty shale	2733 - 2755
10	Shale, gray, in part silty and micaceous	2755 - 2765
38	Shale, gray, silty and micaceous, with some interbedded gray shale and a little grayish-black silty shale	2765 - 2803
51	Shale, gray, in part silty and micaceous, with a great deal of interbedded very dark gray shale	2803 - 2854
11	Shale, gray, in part silty, with considerable interbedded grayish-black shale	2854 - 2865
15	Shale, very dark gray, in part silty, with a great deal of interbedded gray silty shale	2865 - 2880
	Bottom of Canadaway group	2880
31	Shale, greenish gray, silty, containing muscovite, with some interbedded gray shale	2880 - 2911
8	Siltstone, greenish gray, slightly calcareous, containing some muscovite	2911 - 2919
10	Shale, greenish gray, silty, containing some muscovite, with some interbedded gray shale	2919 - 2929
81	Shale, gray, sandy, containing some muscovite, with a little interbedded gray shale	2929 - 3010
44	Shale, greenish gray, sandy, containing some muscovite, with some interbedded dark gray shale, in part silty	3010 - 3054
23	Shale, grayish black, with considerable interbedded greenish-gray sandy shale containing some muscovite	3054 - 3077

Thickness Feet	Description of Strata	Depth in feet
26	Shale, greenish gray, sandy, containing some muscovite, with a little interbedded gray shale	3077 - 3103
61	Shale, gray to greenish gray, silty, with a little interbedded gray shale	3103 - 3164
21	Shale, greenish gray, sandy, containing some muscovite, with some interbedded gray shale	3164 - 3185
45	Shale, greenish gray, sandy, containing some muscovite, with a little interbedded dark gray silty shale	3185 - 3230
17	Shale, gray, silty, with some interbedded greenish gray sandy shale containing minute fragments of carbonized plant remains	3230 - 3247
9	Shale, greenish gray, sandy, with some interbedded dark to very dark gray silty shale	3247 - 3256
67	Shale, dark gray, with a great deal of interbedded greenish-gray, sandy shale containing some muscovite	3256 - 3323
37	Shale, gray, with some interbedded greenish-gray silty shale	3323 - 3360
102	Shale, greenish gray, sandy, containing some muscovite, with some interbedded dark gray shale	3360 - 3462
93	Shale, gray to dark gray, with some interbedded dark to very dark gray silty shale	3462 - 3555
24	Shale, dark gray, with considerable interbedded greenish-gray silty shale	3555 - 3579
47	Shale, gray, in part silty, with some interbedded dark to very dark gray shale	3579 - 3626
20	Siltstone, greenish gray, containing considerable muscovite, with considerable interbedded dark gray shale	3626 - 3646
81	Shale, dark gray, with some interbedded greenish-gray silty shale containing some muscovite	3646 - 3727
29	Shale, dark gray, with considerable interbedded greenish-gray siltstone containing muscovite	3727 - 3756

Thickness Feet	Description of Strata	Depth in feet
20	Shale, grayish black	3756 - 3776
18	Shale, dark gray, with some interbedded greenish gray, somewhat calcareous silty shale and a little grayish-black shale	3776 - 3794
21	Shale, dark gray, with considerable interbedded greenish-gray siltstone containing some muscovite	3794 - 3815
20	Shale, gray to dark gray, in part silty, with a little interbedded grayish-black shale	3815 - 3835
25	Shale, very dark gray, with some interbedded gray silty shale	3835 - 3860
11	Shale, very dark gray, with some interbedded grayish-black shale	3860 - 3871
60	Shale, very dark gray, with considerable interbedded gray shale	3871 - 3931
7	Shale, grayish black	3931 - 3938
26	Shale, gray, in part silty, with considerable interbedded very dark gray shale	3938 - 3964
10	Shale, grayish black, with some interbedded gray shale	3964 - 3974
22	Shale, gray, with considerable interbedded grayish-black shale	3974 - 3996
20	Shale, dark gray, with some interbedded grayish-black shale	3996 - 4016
27	Shale, dark to very dark gray, in part silty	4016 - 4043
24	Shale, dark gray, with considerable interbedded grayish-black shale	4043 - 4067
32	Shale, dark gray, with considerable interbedded very dark gray shale	4067 - 4099
60	Shale, very dark gray, in part silty, with some interbedded grayish-black shale	4099 - 4159
40	Shale, dark gray	4159 - 4199

Thickness Feet	Description of Strata	Depth in feet
36	Shale, very dark gray to grayish black, with some interbedded dark gray shale	4199 - 4235
38	Shale, grayish black, with some interbedded dark gray shale containing an occasional shell fragment	4235 - 4273
52	Shale, grayish black	4273 - 4325
54	Shale, very dark gray, silty, with some interbedded grayish-black shale	4235 - 4379
60	Shale, grayish black, calcareous	4379 - 4439
17	Shale, very dark gray, somewhat calcareous	4439 - 4456
11	Shale, very dark gray to grayish black, somewhat calcareous	4456 - 4467
	Middle Devonian Series, 407 feet	
	Hamilton group, 349 feet	
2	Limestone, very fine, dense, light gray to brownish gray, argillaceous	4467 - 4469
30	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black, somewhat calcareous shale and a little very fine, dense, brownish-gray argillaceous limestone	4469 - 4499
108	Shale, very dark gray, somewhat calcareous	4499 - 4607
8	Shale, grayish black, calcareous	4607 - 4615
14	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black, somewhat calcareous shale	4615 - 4629
31	Shale, very dark gray, somewhat calcareous	4629 - 4660
5	Shale, grayish black, calcareous	4660 - 4665
15	Shale, very dark gray, calcareous, with a little interbedded very fine, dense, dark gray, argillaceous limestone	4665 - 4680
153	No samples	4680 - 4833
	Onondaga limestone, 58 feet	
	Top of Onondaga, from drillers' log	4816

Thickness Feet	Description of Strata	Depth in feet
11	Limestone, very fine, dense, very dark brownish gray, almost black, somewhat argillaceous	4833 - 4844
13	Limestone, very fine, dense, dark brownish gray, argillaceous; insoluble clay residue full of micro-fossil molds	4844 - 4857
1	Bentonite, light brownish gray, containing abundant biotite	4857 - 4858
9	Limestone, very fine, dense, brownish gray, argillaceous, containing considerable light brownish-gray dense chert	4858 - 4867
6	Limestone, very fine, dense, dark brownish gray, argillaceous, containing considerable light brownish-gray dense chert	4867 - 4873
1	Shale, dark gray, silty, containing abundant glauconite and a few rounded quartz grains	4873 - 4874
	Lower Devonian Series, 24+ feet	
	Oriskany sandstone, 24+ feet	
2	Sandstone, fine to medium-grained, light gray, quartzose, somewhat calcareous; a few of the quartz grains are well rounded and frosted, but due to tightness of bond, most of grains fractured in drilling	4874 - 4876
6	Sandstone, fine to medium-grained, light gray, quartzose, very hard	4876 - 4882
10	Sandstone, fine-grained, light gray, quartzose, very hard	4882 - 4892
6	Sandstone, very fine to fine-grained, light brownish gray, quartzose, slightly calcareous, very hard	4892 - 4898
	One bailer of SALT WATER per hour from Oriskany	
	TOTAL DEPTH	4898

WELL-SAMPLE RECORD

NO.

16

WELL-SAMPLE RECORD

CENTRAL PENNSYLVANIA LUMBER COMPANY NO. 1 WELL
PENN-BRADFORD OIL COMPANY

McKean County, Pa., Hamilton Township, Warrant 5574
Kinzua Quadrangle: 1.70 miles south of 41° 50' N. Lat. and 1.12 miles east of 78° 55' W. Long.
Completed: March 15, 1939.
Elevation: 1342 feet above sea level.
Total depth: 4146 feet.
Deepest formation: Cobleskill limestone.
Result: 10,000 cubic feet of gas per day, initial open flow, and salt water in top of Oriskany. Salt water bailed off.
Samples: 210 to 3575 feet and 4000 to 4146 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4143+ feet	
	Upper Devonian Series, 3760+ feet	
	Conneaut group, 660+ feet	
210	No samples	0 - 210
50	Shale, greenish gray, slightly calcareous, sandy	210 - 260
10	Siltstone, greenish gray, slightly calcareous, containing fragments of shells, with a little interbedded dark purplish-gray shale	260 - 270
50	Siltstone, greenish gray, containing fragments of shells, with some interbedded greenish-gray shale	270 - 320
20	Shale, dark greenish gray, with a little interbedded dark purplish-gray shale	320 - 340
10	Shale, dark greenish gray, with some interbedded greenish-gray siltstone	340 - 350
60	Shale, dark purplish gray, in part sandy, with a little interbedded greenish-gray siltstone containing fragments of shells	350 - 410

Central Pennsylvania Lumber Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
	Bottom of "pink rock"	410
60	Shale, greenish gray	410 - 470
110	Shale, greenish gray, with some interbedded greenish-gray siltstone containing fragments of shells	470 - 580
30	Shale, dark greenish gray	580 - 610
50	Siltstone, light greenish gray, somewhat calcareous, containing fragments of shells, with some interbedded greenish-gray shale	610 - 660
	Canadaway group, 1540 feet	
100	Shale, dark greenish gray, with some interbedded light greenish-gray siltstone, containing fragments of shells	660 - 760
	Top of Clarendon sand	760
20	Sandstone, very fine-grained, light greenish gray, with a little interbedded greenish-gray shale	760 - 780
10	Siltstone, light greenish gray, with considerable interbedded gray shale	780 - 790
30	Sandstone, very fine-grained, light greenish gray, with some interbedded gray shale	790 - 820
	Bottom of Clarendon sand	820
20	Siltstone, light greenish gray, slightly calcareous, with considerable interbedded gray shale	820 - 840
120	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	840 - 960
30	Sandstone, very fine-grained, light greenish gray, with some interbedded dark greenish-gray shale; Bradford Second sand	960 - 990
90	Shale, dark greenish gray	990 - 1080
30	Shale, dark greenish gray, with considerable interbedded greenish and brownish-gray siltstone	1080 - 1110

Central Pennsylvania Lumber Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Shale, greenish gray, with some interbedded light greenish-gray siltstone	1110 - 1130
8	Siltstone, greenish gray	1130 - 1138
32	Shale, dark greenish gray, with some interbedded light greenish-gray siltstone	1138 - 1170
7	Sandstone, very fine-grained, light greenish gray; Deer Lick sand	1170 - 1177
33	Shale, dark greenish gray, with considerable interbedded light greenish-gray siltstone	1177 - 1210
20	Siltstone, greenish gray, with considerable interbedded dark greenish-gray shale	1210 - 1230
40	Shale, greenish gray, with some interbedded greenish-gray siltstone	1230 - 1270
30	Shale, greenish gray	1270 - 1300
70	Shale, dark greenish gray	1300 - 1370
20	Shale, greenish gray, sandy	1370 - 1390
40	Shale, dark greenish gray, with some interbedded greenish-gray siltstone	1390 - 1430
80	Shale, dark greenish gray	1430 - 1510
88	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	1510 - 1598
22	Shale, dark greenish gray	1598 - 1620
30	Shale, very dark gray, with considerable interbedded greenish-gray siltstone	1620 - 1650
30	Shale, dark gray, with some interbedded greenish-gray, slightly calcareous siltstone	1650 - 1680
20	Shale, very dark gray, with some interbedded greenish-gray, slightly calcareous siltstone	1680 - 1700
70	Shale, dark gray	1700 - 1770
190	Shale, dark gray, with a little interbedded greenish-gray siltstone	1770 - 1960
10	Shale, greenish gray	1960 - 1970

Central Pennsylvania Lumber Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
60	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	1970 - 2030
30	Siltstone, greenish gray, with some interbedded dark greenish-gray shale	2030 - 2060
70	Shale, greenish gray, with some interbedded greenish-gray siltstone	2060 - 2130
30	Shale, dark gray, with a little interbedded greenish-gray siltstone	2130 - 2160
20	Shale, very dark gray, with considerable interbedded greenish-gray shale	2160 - 2180
20	Shale, greenish gray, with some interbedded very dark gray shale	2180 - 2200
	Bottom of Canadaway group	2200
20	Shale, dark gray, with a little interbedded greenish-gray siltstone	2200 - 2220
20	Shale, dark greenish gray, sandy	2220 - 2240
30	Siltstone, greenish gray, somewhat calcareous, with considerable interbedded dark gray shale	2240 - 2270
30	Shale, dark greenish gray, sandy	2270 - 2300
40	Shale, dark greenish gray, sandy, with some interbedded very dark gray shale	2300 - 2340
20	Shale, dark greenish gray	2340 - 2360
40	Shale, grayish black, with some interbedded greenish-gray siltstone	2360 - 2400
20	Siltstone, greenish gray, somewhat calcareous, with some interbedded grayish-black shale	2400 - 2420
10	Shale, gray, sandy, with considerable interbedded greenish-gray siltstone	2420 - 2430
60	Siltstone, dark greenish gray, slightly calcareous, with some interbedded dark gray shale	2430 - 2490
10	Siltstone, brownish and greenish gray, slightly calcareous, with some interbedded dark greenish-gray shale	2490 - 2500

Central Pennsylvania Lumber Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, dark greenish gray	2500 - 2510
20	Shale, greenish gray, with some interbedded dark gray shale	2510 - 2530
10	Shale, dark to very dark gray	2530 - 2540
10	Siltstone, greenish gray, with considerable interbedded dark gray shale	2540 - 2550
50	Shale, dark greenish gray, sandy, with considerable interbedded dark gray shale	2550 - 2600
40	Shale, dark greenish gray, sandy	2600 - 2640
190	Shale, dark to very dark gray	2640 - 2830
10	Siltstone, greenish gray, with some interbedded very dark gray shale	2830 - 2840
70	Shale, dark to very dark gray	2840 - 2910
10	Shale, dark greenish gray, sandy	2910 - 2920
90	Shale, dark gray, with some interbedded greenish-gray siltstone	2920 - 3010
40	Shale, dark gray	3010 - 3050
20	Shale, grayish black	3050 - 3070
50	Shale, dark gray, with a little interbedded grayish-black shale	3070 - 3120
80	Shale, very dark gray	3120 - 3200
140	Shale, dark gray, with some interbedded grayish-black shale	3200 - 3340
235	Shale, dark to very dark gray	3340 - 3575
425	No samples	3575 - 4000
	Middle Devonian Series, 357 feet	
	Hamilton group, 310 feet	
25	Lime (from drillers' log)	3760 - 3785
70	Shale, grayish black, slightly calcareous	4000 - 4070

Central Pennsylvania Lumber Co. No. 1

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 47 feet	
36	Limestone, dense, very dark brownish gray to brownish black, argillaceous	4070 - 4106
11	Limestone, dense, brownish gray, very cherty	4106 - 4117
	Lower Devonian Series, 26 feet	
	Oriskany sandstone, 26 feet	
3	Sandstone, medium-grained, brownish gray, very calcareous	4117 - 4120
5	Sandstone, medium-grained, light gray, slightly calcareous; 10,000 cubic feet of GAS and SALT WATER, salt water bailed off	4120 - 4125
18	Sandstone, fine to medium-grained, light gray, slightly calcareous	4125 - 4143
	SILURIAN SYSTEM, 3+ feet	
	Upper Silurian or Cayugan Series, 3+ feet	
	Cobleskill limestone, 3+ feet	
3	Limestone, dense, dark grayish brown, magnesian	4143 - 4146
	TOTAL DEPTH	4146

WELL-SAMPLE RECORD
NO.
17

SAMPLE DESCRIPTION

L. D. WILSON NO. 18 WELL
SOUTH PENN OIL COMPANY

McKean County, Pa., Lafayette Township.
Bradford Quadrangle: 1.23 miles north of 41° 45' N. Lat. and 1.44 miles east of 78° 45' W. Long.
Completed: August 4, 1948.
Elevation: 1550 feet above sea level.
Total depth: 8002 feet.
Deepest formation: Reedsville.
Result: Slight show of oil in Dew Drop sand, show of oil and gas in Harrisburg Run, oil in Bradford Third, show of gas in Lewis Run, show of gas in Upper Kane, and show of oil and gas in Haskill. Oriskany sandstone absent. Dry in Albion and Oswego. Electric log indicated that there may be a little salt water in the Whirlpool sandstone and the Oswego. The drillers did not observe any salt water until after a 24-hour shut down at 7915 feet when the well was found to be making about 2/3 bailer of salt water per day.
Samples: 0 to 8002 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Alluvium, 77 feet	
77	Sand and sandstone boulders, fine to very coarse grained, light yellowish- to light reddish-brown, with some quartz pebbles up to 3 mm. in diameter	0 - 77
	DEVONIAN SYSTEM, 4715+ feet	
	Upper Devonian Series, 4248+ feet	
	Cattaraugus formation, 185+ feet	
38	Shale, dark brick-red, silty, with a little interbedded greenish-gray siltstone, 10-inch drive pipe set at 79 feet	77 - 115
32	Siltstone, light grayish-green, slightly calcareous, containing minute fragments of carbonized plant remains and some brown siderite concretions in lower part, with some interbedded greenish-gray silty shale	115 - 147

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine grained, light grayish-green, containing occasional minute fragments of carbonized plant remains and some brown siderite concretions, with a little interbedded greenish-gray shale	147 - 152
42	Shale, dark brick-red, silty, with a little interbedded greenish-gray siltstone and shale	152 - 194
11	Sandstone, very fine grained, greenish-gray, containing a little muscovite, with some interbedded greenish-gray silty shale	194 - 205
11	Shale, greenish-gray, silty, with some interbedded very fine grained greenish-gray sandstone containing a little muscovite	205 - 216
16	Shale, greenish-gray, sandy	216 - 232
11	Sandstone, very fine grained, greenish-gray, slightly calcareous, with a little interbedded greenish-gray silty shale	232 - 243
19	Shale, dark brick-red, in part silty, containing a little muscovite	243 - 262
	Conneaut group, 715 feet	
14	Shale, greenish-gray, silty and sandy, slightly calcareous, containing a little muscovite, with a little interbedded brick-red shale	262 - 276
12	Shale, greenish-gray, silty and sandy, containing a little muscovite	276 - 288
19	Shale, dark greenish-gray, in part silty, with a little interbedded greenish-gray slightly calcareous siltstone and a little brick-red shale	288 - 307
6	Shale, dark greenish-gray, in part silty, with some interbedded brick-red silty shale	307 - 313
6	Shale, dark greenish-gray, silty, with considerable interbedded greenish-gray siltstone containing an occasional shell fragment and a very little dark purplish-gray silty shale	313 - 319
8	Shale, dark greenish-gray, silty, with a very little interbedded dark purplish-gray shale	319 - 327

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
23	Shale, dark greenish-gray, in part silty, with some interbedded greenish-gray slightly calcareous siltstone	327 - 350
14	Siltstone, greenish-gray, with considerable interbedded dark-gray shale	350 - 364
14	Shale, dark greenish-gray, silty, containing an occasional shell fragment	364 - 378
	Top of "pink rock"	378
38	Shale, dark purplish-gray, silty, containing fragments of shells, with some interbedded dark greenish-gray silty shale, also containing fragments of shells	378 - 416
66	Shale, dark greenish-gray, in part silty, 8-inch casing set at 436 feet	416 - 482
63	Shale, dark gray, in part silty, with considerable interbedded greenish-gray siltstone containing fragments of shells	482 - 545
9	Shale, dark purplish-gray, with some interbedded dark greenish-gray shale, in part silty	545 - 554
20	Siltstone, greenish-gray, containing fragments of shells, with considerable interbedded dark greenish-gray silty shale	554 - 574
47	Shale, dark-gray, in part silty, with some interbedded greenish-gray siltstone containing fragments of shells	574 - 621
57	Shale, dark purplish-gray, in part silty, with some interbedded dark-gray shale and some greenish-gray siltstone containing fragments of shells	621 - 678
19	Shale, dark purplish-gray, in part silty, containing occasional fragments of shells, with some interbedded dark-gray shale	678 - 697
27	Shale, dark-gray, with considerable interbedded dark purplish-gray silty shale and some greenish-gray siltstone containing fragments of shells	697 - 724
	Bottom of "pink rock"	724

Thickness Feet	Description of Strata	Depth in feet
43	Shale, dark-gray, with considerable interbedded greenish-gray silty shale	724 - 767
28	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	767 - 795
18	Shale, dark-gray, with some interbedded light greenish-gray siltstone	795 - 813
37	Shale, dark greenish-gray, in part silty	813 - 850
46	Shale, dark greenish-gray, in part silty, with a little interbedded greenish-gray siltstone containing fragments of shells	850 - 896
9	Shale, dark greenish-gray, in part silty, with some interbedded greenish-gray siltstone containing fragments of shells and a little dark purplish-gray shale	896 - 905
31	Shale, greenish-gray, silty	905 - 936
	Top of Bradford First sand	936
12	Sandstone, very fine grained, very light gray, somewhat calcareous, containing fragments of shells in upper part, with considerable interbedded gray shale	936 - 948
10	Sandstone, very fine grained, very light gray, somewhat calcareous, containing fragments of shells, with some interbedded gray shale	948 - 958
19	Shale, greenish-gray, silty, with some interbedded very fine grained light greenish-gray sandstone containing fragments of shells	958 - 977
	Bottom of Bradford First sand	977
	Canadaway group, 1344 feet	
56	Shale, dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	977 - 1033
	Top of Dew Drop sand	1033
20	Sandstone, very fine grained, light greenish-gray, with considerable interbedded dark-gray shale	1033 - 1053

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
23	Sandstone, very fine grained, light greenish-gray, with some interbedded gray shale	1053 - 1076
8	Sandstone, very fine, very light greenish-gray, with a little interbedded gray shale, slight show of OIL in Dew Drop sand	1076 - 1084
	Bottom of Dew Drop sand	1084
18	Shale, gray, with considerable interbedded very fine grained light-gray sandstone	1084 - 1102
29	Shale, gray, with some interbedded very fine grained light-gray sandstone	1102 - 1131
9	Shale, gray, with considerable interbedded very fine grained light greenish-gray sandstone containing an occasional shell fragment	1131 - 1140
42	Shale, dark-gray, with a little interbedded very fine grained light-gray sandstone	1140 - 1182
	Top of Bradford Second sand	1182
8	Sandstone, very fine grained, light-gray, with some interbedded dark-gray shale	1182 - 1190
11	Sandstone, very fine grained, light-gray, with considerable interbedded dark-gray shale	1190 - 1201
10	Shale, dark-gray, with considerable interbedded very fine grained light-gray sandstone	1201 - 1211
20	Sandstone, very fine grained, light-gray, containing a little biotite, with some interbedded dark-gray shale	1211 - 1231
	Bottom of Bradford Second sand	1231
18	Shale, dark-gray, with a little interbedded very fine grained light-gray sandstone	1231 - 1249
17	Shale, dark-gray, with a little interbedded very fine grained, very light brownish-gray sandstone containing fragments of shells	1249 - 1266

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
28	Sandstone, very fine grained, very light brownish-gray, slightly calcareous, containing a little biotite and muscovite, with a little interbedded gray shale, show of GAS and OIL, Harrisburg Run sand	1266 - 1294
18	Shale, gray, with some interbedded very fine grained, very light brownish-gray sandstone	1294 - 1312
38	Shale, gray to dark-gray, with some interbedded very fine grained, very light greenish-gray sandstone	1312 - 1350
19	Shale, dark-gray, with a little interbedded gray siltstone	1350 - 1369
11	Siltstone, gray, with considerable interbedded dark-gray shale	1369 - 1380
27	Shale, gray, with considerable interbedded gray slightly calcareous siltstone containing an occasional shell fragment	1380 - 1407
13	Siltstone, light greenish-gray, somewhat calcareous, containing fragments of shells, with considerable interbedded gray shale	1407 - 1420
65	Shale, gray, with a little interbedded light greenish-gray slightly calcareous siltstone containing fragments of shells	1420 - 1485
8	Siltstone, dark brownish-gray, somewhat calcareous, containing fragments of shells, with some interbedded dark-gray shale	1485 - 1493
	Top of Bradford Third sand	1493
14	Sandstone, very fine grained, chocolate-brown, containing a little muscovite, with a little interbedded dark-gray shale	1493 - 1507
19	Shale, gray to dark-gray, with considerable interbedded grayish-brown siltstone	1507 - 1526
11	Shale, gray to dark-gray, with some interbedded very fine grained grayish-brown sandstone containing a little biotite	1526 - 1537
19	Sandstone, very fine grained, grayish-brown, with considerable interbedded gray to dark-gray shale, OIL in Bradford Third sand	1537 - 1556

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
	Bottom of Bradford Third sand	1556
9	Siltstone, greenish-gray, slightly calcareous, containing fragments of shells, with some interbedded dark-gray shale	1556 - 1565
23	Shale, gray to dark-gray, with a little interbedded grayish-brown siltstone and a little very fine grained light-gray slightly calcareous sandstone	1565 - 1588
35	Sandstone, very fine grained, grayish-brown, containing a little biotite, with considerable interbedded gray shale, show of GAS, Lewis Run sand	1588 - 1623
8	Shale, greenish-gray, with a little interbedded light-gray siltstone containing fragments of shells	1623 - 1631
104	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells including bryozoa	1631 - 1735
19	Shale, gray, with a little interbedded dark grayish-brown siltstone	1735 - 1754
22	Sandstone, very fine grained, grayish-brown, with considerable interbedded dark-gray shale, show of GAS, Upper Kane sand	1754 - 1776
36	Shale, gray to dark-gray, with considerable interbedded grayish-brown siltstone	1776 - 1812
69	Shale, gray to dark-gray, with a little interbedded very fine grained dark grayish-brown sandstone and a little greenish-gray slightly calcareous siltstone	1812 - 1881
16	Shale, dark-gray	1881 - 1897
32	Shale, dark-gray, with a little interbedded very fine grained dark grayish-brown sandstone and a little greenish-gray slightly calcareous siltstone	1897 - 1929
33	Shale, dark-gray	1929 - 1962
25	Shale, dark-gray, with a little interbedded dark grayish-brown siltstone and a little light-gray siltstone	1962 - 1987

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
	Top of Haskill sand	1987
11	Sandstone, very fine grained, dark grayish-brown, with a great deal of interbedded gray shale	1987 - 1998
40	Shale, gray, with considerable interbedded very fine grained, grayish-brown sandstone, show of GAS and OIL	1998 - 2038
	Bottom of Haskill sand	2038
14	Shale, gray to dark-gray, with a little interbedded very fine grained grayish-brown sandstone	2038 - 2052
16	Shale, gray to dark-gray	2052 - 2068
16	Shale, gray, with a little interbedded greenish-gray siltstone	2068 - 2084
10	Shale, greenish-gray, in part silty, with some interbedded very dark gray silty shale	2084 - 2094
10	Shale, dark-gray, silty, with considerable interbedded greenish-gray silty shale	2094 - 2104
19	Shale, dark to very dark gray, silty, with a little interbedded greenish-gray silty shale	2104 - 2123
10	Shale, very dark gray, silty	2123 - 2133
43	Shale, dark-gray, with some interbedded greenish-gray silty shale	2133 - 2176
20	Shale, gray to dark-gray, with a little interbedded light-gray slightly calcareous siltstone	2176 - 2196
24	Shale, gray	2196 - 2220
8	Shale, gray to dark-gray, with a little interbedded light-gray slightly calcareous siltstone	2220 - 2228
19	Shale, gray, with a little interbedded very dark gray shale	2228 - 2247
17	Shale, gray, containing minute spherical pyrite pellets, with considerable interbedded very dark gray shale	2247 - 2264

Wilson No. 18

Thickness Feet	Description of Strata	Depth in feet
9	Shale, greenish-gray, silty, with considerable interbedded very dark gray shale	2264 - 2273
20	Shale, greenish-gray, silty, slightly calcareous, containing a little muscovite	2273 - 2293
10	Shale, dark to very dark gray, with considerable interbedded greenish-gray silty shale	2293 - 2303
18	Shale, greenish-gray, silty, with considerable interbedded very dark gray shale containing minute spherical pyrite pellets	2303 - 2321
	Bottom of Canadaway group	2321
12	Shale, greenish-gray, silty, with some interbedded dark-gray shale	2321 - 2333
39	Shale, gray to dark-gray	2333 - 2372
21	Siltstone, greenish-gray, with considerable interbedded gray shale	2372 - 2393
21	Shale, greenish-gray, in part silty, with some interbedded very dark gray shale	2393 - 2414
39	Shale, gray, in part silty, with some interbedded dark to very dark gray shale	2414 - 2453
40	Shale, greenish-gray, silty, with some interbedded dark-gray shale	2453 - 2493
55	Shale, gray, with considerable interbedded light-gray siltstone	2493 - 2548
39	Shale, greenish-gray, silty and slightly calcareous	2548 - 2587
48	Shale, greenish-gray, silty, slightly calcareous, containing some muscovite, with some interbedded gray to dark-gray shale	2587 - 2635
42	Shale, dark greenish-gray, silty, with considerable interbedded dark-gray shale	2635 - 2677
31	Shale, dark greenish-gray, silty, with a little interbedded grayish-black shale	2677 - 2708
27	Shale, dark greenish-gray, silty and slightly calcareous, containing some minute fragments of carbonized plant remains, with some interbedded dark-gray shale	2708 - 2735

Thickness Feet	Description of Strata	Depth in feet
30	Shale, dark to very dark gray, with considerable interbedded dark greenish-gray silty shale	2735 - 2765
12	Siltstone, dark brownish-gray, with a little interbedded dark-gray shale	2765 - 2777
37	Shale, dark greenish and brownish-gray, silty	2777 - 2814
30	Shale, dark greenish-gray, silty, and slightly calcareous, with considerable interbedded dark to very dark gray shale	2814 - 2844
37	Shale, dark greenish-gray, silty, minutely laminated, with a little interbedded dark-gray shale	2844 - 2881
55	Shale, greenish-gray, silty, containing some muscovite, with a little interbedded dark-gray shale	2881 - 2936
67	Shale, greenish-gray, silty, containing some muscovite, with some interbedded dark-gray shale	2936 - 3003
19	Shale, dark to very dark gray, with some interbedded greenish-gray siltstone, containing some muscovite	3003 - 3022
26	Shale, gray to dark-gray, with a little interbedded very dark gray silty shale	3022 - 3048
38	Shale, dark-gray, with a little interbedded greenish-gray silty shale	3048 - 3086
10	Shale, very dark gray, silty, with considerable interbedded dark-gray shale	3086 - 3096
30	Shale, dark-gray, in part silty, with some interbedded very dark gray shale	3096 - 3126
24	Shale, dark-gray, in part silty	3126 - 3150
11	Shale, dark-gray, silty, containing occasional minute fragments of carbonized plant remains, with some interbedded very dark gray shale	3150 - 3161
12	Shale, dark-gray, in part silty, with a little interbedded grayish-black shale	3161 - 3173

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Thickness Feet	Description of Strata	Depth in feet
27	Shale, dark-gray, in part silty	3173 - 3200
10	Shale, dark-gray, with a little interbedded grayish-black shale	3200 - 3210
10	Shale, greenish-gray, silty, containing some muscovite, with some interbedded dark-gray shale	3210 - 3220
70	Shale, dark-gray, in part silty	3220 - 3290
8	Shale, dark brownish-gray, silty, with considerable interbedded dark greenish-gray shale and some dark-gray shale	3290 - 3298
70	Shale, greenish-gray, silty, with some interbedded dark-gray shale	3298 - 3368
30	Shale, dark-gray, with some interbedded greenish-gray silty shale	3368 - 3398
30	Shale, dark-gray, with some interbedded dark grayish-brown silty shale	3398 - 3428
75	Shale, dark-gray, with some interbedded gray silty shale	3428 - 3503
8	Shale, dark-gray, with considerable interbedded light greenish-gray siltstone and a little grayish-black shale	3503 - 3511
28	Shale, gray, silty, containing some muscovite, with considerable interbedded dark to very dark gray shale	3511 - 3539
27	Shale, very dark gray to grayish-black	3539 - 3566
43	Shale, grayish-black, with some interbedded dark-gray shale	3566 - 3609
109	Shale, gray to dark-gray, with a little interbedded gray silty shale and a little grayish-black shale	3609 - 3718
20	Shale, very dark gray to grayish-black	3718 - 3738
7	Shale, grayish-black, with considerable interbedded dark-gray shale	3738 - 3745
20	Shale, dark-gray, in part silty, with considerable interbedded grayish-black shale	3745 - 3765

Thickness Feet	Description of Strata	Depth in feet
69	Shale, dark-gray, with some interbedded grayish-black shale	3765 - 3834
45	Shale, dark to very dark gray	3834 - 3879
55	Shale, dark-gray, with a little interbedded gray slightly calcareous silty shale	3879 - 3934
42	Shale, gray, slightly calcareous	3934 - 3976
21	Shale, dark-gray, with some interbedded grayish-black shale	3976 - 3997
29	Shale, grayish-black	3997 - 4026
31	Shale, grayish-black, with a little interbedded very fine, dense, dark-gray argillaceous limestone	4026 - 4057
10	Shale, grayish-black	4057 - 4067
10	Shale, grayish-black, with some interbedded very dark gray shale	4067 - 4077
13	Shale, grayish-black	4077 - 4090
18	Shale, very dark brownish gray, silty	4090 - 4108
32	Shale, very dark gray, slightly calcareous, with some interbedded grayish-black shale	4108 - 4140
22	Shale, very dark gray, silty and slightly calcareous, in part minutely laminated	4140 - 4162
31	Shale, very dark gray to grayish-black, somewhat calcareous, and in part silty	4162 - 4193
32	Shale, grayish-black	4193 - 4225
15	Shale, very dark gray, with some interbedded very dark brownish gray somewhat calcareous silty shale	4225 - 4240
8	Shale, very dark gray to grayish-black, very slightly calcareous	4240 - 4248
	Middle Devonian Series, 479 feet	
	Hamilton group, 407 feet	
2	Limestone, very fine, dense, brownish-gray, containing an occasional shell fragment	4248 - 4250

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Thickness Feet	Description of Strata	Depth in feet
56	Shale, very dark gray, somewhat calcareous	4250 - 4306
11	Limestone, very fine, dense, light brownish-gray, argillaceous, containing an occasional coral fragment, with a great deal of interbedded very dark gray to grayish-black somewhat calcareous shale	4306 - 4317
68	Shale, dark-gray, somewhat calcareous	4317 - 4385
10	Shale, dark to very dark gray, calcareous, with a little interbedded very fine, dense, light brownish-gray limestone	4385 - 4395
63	Shale, dark-gray, somewhat calcareous	4395 - 4458
11	Shale, dark-gray, somewhat calcareous, with some interbedded grayish-black somewhat calcareous shale	4458 - 4469
88	Shale, dark to very dark gray, somewhat calcareous	4469 - 4557
24	Shale, grayish-black, containing an occasional fragment of a brachiopod shell	4557 - 4581
21	Shale, grayish-black, with some interbedded very dark gray somewhat calcareous shale and a little very fine, dense, light brownish-gray limestone	4581 - 4602
39	Shale, grayish-black, somewhat calcareous	4602 - 4641
4	Shale, grayish-black, in part slightly calcareous, with some interbedded very fine, dense, light brownish-gray limestone	4641 - 4645
9	Shale, grayish-black, in part somewhat calcareous	4645 - 4654
1	Shale, brown, bentonitic	4654 - 4655
	Onondaga limestone, 72 feet	
9	Limestone, very dark gray, shaly, containing fragments of shells	4655 - 4664
20	Limestone, very fine, dense, dark gray, argillaceous, containing abundant fragments of shells	4664 - 4684

Thickness Feet	Description of Strata	Depth in feet
19	Limestone, very fine, dense, brownish- to dark brownish-gray, argillaceous and silty	4684 - 4703
6	Limestone, very fine, dense, light brownish-gray, argillaceous and silty, containing a few shell fragments and a little light-gray chalcedonic chert	4703 - 4709
12	Limestone, very fine, dense, light brownish-gray, argillaceous and silty, containing some glauconite and considerable light brownish-gray chalcedonic chert, with considerable interbedded brownish- to dark brownish-gray shaly limestone containing glauconite	4709 - 4721
6	Limestone, very fine, dense, brownish-gray, argillaceous and silty, containing considerable light brownish-gray chalcedonic chert and a few medium rounded quartz grains, with a little interbedded brownish-gray shaly and silty limestone containing glauconite	4721 - 4727
	Lower Devonian Series, 65 feet	
	Helderberg limestone, 65 feet	
26	Limestone, very fine, dense, brownish-gray, somewhat argillaceous and magnesian, containing an occasional shell fragment and a little light brownish-gray granular chert	4727 - 4753
31	Limestone, very fine, crystalline, grayish-brown, containing a little light brownish-gray granular chert	4753 - 4784
8	Limestone, very fine, dense, dark brownish-gray	4784 - 4792
	SILURIAN SYSTEM, 1534 feet	
	Upper Silurian or Cayugan Series, 957 feet	
	Cobleskill limestone, 39 feet	
6	Limestone, very fine, crystalline, light brownish-gray, somewhat argillaceous and magnesian	4792 - 4798
7	Limestone, very fine, dense, light brownish-gray, argillaceous and dolomitic	4798 - 4805

Thickness Feet	Description of Strata	Depth in feet
26	Limestone, very fine, dense to crystalline, dark grayish-brown, argillaceous and somewhat magnesian	4805 - 4831
	Salina group, 918 feet	
85	Limestone, very fine, dense, grayish- to dark grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	4831 - 4916
19	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, containing considerable anhydrite, with some interbedded greenish-gray dolomitic shale	4916 - 4935
60	Anhydrite, very fine, crystalline, gray, argillaceous and dolomitic	4935 - 4995
31	Limestone, very fine, dense, dark brownish-gray, argillaceous and dolomitic, containing some anhydrite	4995 - 5026
155	Dolomite, very fine, dense, argillaceous, containing considerable anhydrite	5026 - 5181
23	Limestone, very fine, dense, grayish- to dark grayish-brown, argillaceous and dolomitic, containing some anhydrite	5181 - 5204
17	Limestone, very fine, dense, grayish- to dark grayish-brown, argillaceous and dolomitic, containing a great deal of anhydrite	5204 - 5221
35	Salt, coarse, crystalline, colorless to light-gray	5221 - 5256
23	Limestone, very fine, dense, light brownish- and greenish-gray, argillaceous and dolomitic, containing considerable anhydrite, with some interbedded salt	5256 - 5279
63	Limestone, very fine, dense, light-gray to grayish-brown, argillaceous and dolomitic, containing considerable anhydrite and occasional medium- to coarse-rounded and frosted quartz grains	5279 - 5342
1	Salt, coarse, crystalline, light-gray to colorless	5342 - 5343
10	Shale, light greenish-gray, dolomitic, with a great deal of interbedded very fine, dense, grayish-brown argillaceous dolomitic limestone containing some anhydrite	5343 - 5353

Thickness Feet	Description of Strata	Depth in feet
16	Limestone, very fine, dense, grayish- to dark grayish-brown, dolomitic, containing some anhydrite	5353 - 5369
12	Limestone, very fine, dense, grayish- to dark grayish-brown, dolomitic, containing some anhydrite, with some interbedded coarse, crystalline, salt	5369 - 5381
22	Limestone, very fine, dense, light- to dark brownish-gray, argillaceous and magnesian, containing some anhydrite	5381 - 5403
17	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine, dense, grayish-brown argillaceous and magnesian limestone	5403 - 5420
12	Anhydrite, very fine, crystalline, light- to dark grayish-brown, argillaceous and dolomitic	5420 - 5432
82	Shale, light greenish- and brownish-gray, dolomitic, containing some anhydrite	5432 - 5514
41	Limestone, brownish-gray, shaly and dolomitic, containing considerable anhydrite	5514 - 5555
8	Salt, coarse, crystalline, light-gray to colorless	5555 - 5563
17	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine, brownish-gray, argillaceous and dolomitic limestone	5563 - 5580
7	Limestone, very fine, dense, brownish-gray, argillaceous and magnesian, containing some anhydrite	5580 - 5587
14	Salt, coarse, crystalline, light-gray to colorless, with considerable interbedded very fine, dense, grayish-brown argillaceous and magnesian limestone containing some anhydrite	5587 - 5601
39	Limestone, very fine, dense, dark grayish-brown, argillaceous and magnesian, containing some anhydrite, with considerable interbedded greenish-gray dolomitic shale	5601 - 5640

Thickness Feet	Description of Strata	Depth in feet
23	Shale, greenish- and dark brownish-gray, dolomitic	5640 - 5663
34	Limestone, very fine, dense, light grayish- to grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	5663 - 5697
28	Limestone, very fine, crystalline, light- to dark brownish-gray, dolomitic and somewhat argillaceous	5697 - 5725
24	Limestone, very fine, dense, brownish- and greenish-gray, shaly and dolomitic	5725 - 5749
	Middle Silurian or Niagaran Series, 411 feet	
	Lockport-Guelph dolomite, 229 feet	
14	Dolomite, very fine, crystalline, dark brownish-gray, somewhat argillaceous, containing a little quartz silt	5749 - 5763
13	Dolomite, very fine, crystalline, light brownish- to brownish-gray, somewhat argillaceous, containing a little quartz silt	5763 - 5776
112	Dolomite, very fine, crystalline, dark brownish-gray, containing a little quartz silt	5776 - 5888
9	Limestone, very fine, crystalline, very dark brownish gray, dolomitic	5888 - 5897
10	Dolomite, very fine, crystalline, dark brownish-gray, slightly argillaceous	5897 - 5907
10	Dolomite, very fine, crystalline, brownish-gray, with considerable interbedded gray to dark-gray, somewhat dolomitic shale	5907 - 5917
29	Limestone, very fine, crystalline, dark brownish gray, dolomitic, containing some very fine to fine subrounded quartz grains	5917 - 5946
6	Limestone, very fine, crystalline, gray, dolomitic, and somewhat argillaceous, silty and sandy	5946 - 5952
7	Shale, gray, dolomitic and silty	5952 - 5959
10	Limestone, very fine, crystalline, gray, dolomitic, sandy and somewhat argillaceous	5959 - 5969

Thickness Feet	Description of Strata	Depth in feet
9	Limestone, very fine, crystalline, brownish-gray, dolomitic, argillaceous and somewhat sandy	5969 - 5978
	Clinton group, 182 feet	
92	Shale, gray, silty and somewhat dolomitic	5978 - 6070
5	Shale, gray, silty and somewhat dolomitic, with a little interbedded very fine, crystalline, light-gray dolomitic limestone	6070 - 6075
48	Shale, grayish-green	6075 - 6123
9	Siltstone, light-gray, calcareous, with some interbedded grayish-green shale	6123 - 6132
23	Shale, greenish-gray, with some interbedded purplish-gray shale	6132 - 6155
5	Limestone, very fine, crystalline, light-gray to gray, silty and dolomitic, with a little interbedded red oolitic hematite	6155 - 6160
	Lower Silurian or Albion Series, 166 feet	
	Grimsby formation, 49 feet	
15	Shale, brick-red, silty	6160 - 6175
5	Shale, grayish-green, with considerable interbedded brick-red sandy shale and argillaceous sandstone	6175 - 6180
2	Sandstone, very fine grained, brick-red, argillaceous	6180 - 6182
13	Shale, brick-red, silty and sandy, with a little interbedded grayish-green shale	6182 - 6195
11	Sandstone, very fine grained, grayish-pink, with a little interbedded brick-red silty shale and a little greenish-gray shale	6195 - 6206
3	Shale, reddish- and greenish-gray, silty, with a great deal of interbedded very fine grained grayish-pink sandstone	6206 - 6209
	Whirlpool sandstone, 117 feet	
14	Sandstone, very fine grained, light-gray, hard, quartzose	6209 - 6223

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Thickness Feet	Description of Strata	Depth in feet
2	Sandstone, very fine grained, light-gray, hard, quartzose, with a little interbedded greenish-gray shale	6223 - 6225
18	Sandstone, very fine to fine-grained, light-gray, hard, quartzose	6225 - 6243
4	Shale, greenish-gray, silty	6243 - 6247
7	Sandstone, very fine to fine-grained, light-gray, hard, quartzose	6247 - 6254
5	Sandstone, very fine to fine-grained, light-gray, hard, quartzose, with a little interbedded greenish-gray silty shale	6254 - 6259
7	Sandstone, fine-grained, light-gray, almost white, hard, quartzose	6259 - 6266
10	Sandstone, fine- to medium-grained, light-gray, almost white, hard, quartzose	6266 - 6276
7	Sandstone, fine-grained, very light gray, almost white, hard, quartzose	6276 - 6283
8	Sandstone, fine- to medium-grained, light-gray, hard, quartzose, with a little interbedded greenish-gray silty shale	6283 - 6291
6	Sandstone, fine- to medium-grained, very light gray, almost white, hard, quartzose	6291 - 6297
7	Sandstone, fine- to medium-grained, light-gray, hard, quartzose, with considerable interbedded greenish-gray sandy shale	6297 - 6304
6	Sandstone, very fine grained, light-gray, hard, quartzose and slightly calcareous, with a little interbedded greenish-gray shale	6304 - 6310
16	Sandstone, very fine to fine-grained, light-gray, hard, quartzose	6310 - 6326
	ORDOVICIAN SYSTEM, 1676+ feet	
	Upper Ordovician or Cincinnatian Series, 1676+ feet	
	Queenston shale, 1265 feet	
37	Shale, dark brick-red, in part silty, with a little interbedded grayish-green shale	6326 - 6363

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Thickness Feet	Description of Strata	Depth in feet
7	Shale, brick-red, silty, with a little interbedded greenish-gray siltstone	6363 - 6370
37	Shale, brick-red, silty	6370 - 6407
7	Shale, brick-red, silty, with a little interbedded greenish-gray siltstone	6407 - 6414
121	Shale, brick-red, in part silty and sandy	6414 - 6535
29	Shale, brick-red, in part silty, with a little interbedded greenish-gray siltstone	6535 - 6564
22	Shale, brick-red, in part silty and sandy	6564 - 6586
48	Shale, grayish-red, sandy and very slightly calcareous, with some interbedded brick-red shale	6586 - 6634
20	Shale, brick-red, slightly calcareous and in part silty	6634 - 6654
37	Shale, brick-red, slightly calcareous and in part silty, with a very little interbedded grayish-green silty shale	6654 - 6691
27	Shale, grayish-red, sandy and slightly calcareous, with considerable interbedded brick-red shale	6691 - 6718
12	Shale, brick-red, slightly calcareous and in part silty, with a little interbedded grayish-green silty shale	6718 - 6730
31	Shale, brick-red, slightly calcareous	6730 - 6761
21	Shale, brick-red, slightly calcareous and in part silty, with a little interbedded greenish-gray slightly calcareous siltstone	6761 - 6782
10	Shale, grayish-red, sandy and slightly calcareous, with a little interbedded brick-red shale	6782 - 6792
35	Shale, brick-red, silty and slightly calcareous	6792 - 6827
35	Sandstone, very fine grained, grayish-red, argillaceous and slightly calcareous, with some interbedded brick-red shale	6827 - 6862

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Thickness Feet	Description of Strata	Depth in feet
33	Shale, brick-red, slightly calcareous and in part silty, with a little interbedded greenish-gray slightly calcareous siltstone	6862 - 6895
10	Shale, brick-red, sandy and slightly calcareous	6895 - 6905
12	Shale, brick-red, in part silty	6905 - 6917
8	Shale, brick-red, with considerable interbedded very fine grained grayish-red argillaceous and slightly calcareous sandstone	6917 - 6925
8	Shale, brick-red, slightly calcareous	6925 - 6933
47	Sandstone, very fine grained, brick-red, argillaceous and slightly calcareous, with some interbedded brick-red shale	6933 - 6980
9	Shale, brick-red, silty and slightly calcareous	6980 - 6989
20	Sandstone, very fine grained, grayish-red, argillaceous and slightly calcareous, with a little interbedded brick-red shale	6989 - 7009
12	Siltstone, grayish-red, slightly calcareous, with a little interbedded brick-red shale	7009 - 7021
25	Sandstone, very fine grained, grayish-red, argillaceous and slightly calcareous, with a little interbedded brick-red shale	7021 - 7046
5	Siltstone, brick-red, slightly calcareous	7046 - 7051
7	Sandstone, very fine grained, grayish-red, argillaceous	7051 - 7058
33	Shale, brick-red, slightly calcareous and in part silty	7058 - 7091
9	Sandstone, very fine grained, grayish-red, argillaceous and slightly calcareous, with a little interbedded brick-red shale	7091 - 7100
10	Shale, brick-red, silty	7100 - 7110
7	Sandstone, very fine grained, grayish-red, with considerable interbedded brick-red shale	7110 - 7117
23	Shale, brick-red, silty and sandy	7117 - 7140

Thickness Feet	Description of Strata	Depth in feet
26	Sandstone, very fine grained, grayish-red, argillaceous, with a little interbedded brick-red shale	7140 - 7166
7	Shale, grayish-red, sandy	7166 - 7173
14	Sandstone, very fine to fine-grained, grayish-red, argillaceous	7173 - 7187
17	Sandstone, very fine to fine-grained, grayish-red, argillaceous, with a little interbedded brick-red shale	7187 - 7204
6	Sandstone, very fine grained, grayish-red, argillaceous, with a little interbedded greenish-gray shale	7204 - 7210
12	Sandstone, very fine grained, grayish-red, argillaceous	7210 - 7222
15	Shale, brick-red, with a great deal of interbedded very fine grained reddish-gray argillaceous sandstone	7222 - 7237
8	Shale, greenish-gray, with some interbedded greenish-gray siltstone	7237 - 7245
5	Siltstone, brick-red, with a little interbedded greenish-gray shale	7245 - 7250
24	Sandstone, very fine grained, grayish-red, argillaceous	7250 - 7274
19	Shale, brick-red, with some interbedded greenish-gray shale and some very fine grained grayish-red argillaceous sandstone	7274 - 7293
9	Shale, grayish-red, sandy, with some interbedded brick-red shale and a little greenish-gray siltstone	7293 - 7302
22	Sandstone, very fine grained, grayish-red, argillaceous	7302 - 7324
7	Shale, brick-red, in part sandy, with some interbedded greenish-gray silty shale	7324 - 7331
12	Sandstone, very fine grained, variegated, grayish-red and greenish-gray, argillaceous, with a little interbedded greenish-gray shale	7331 - 7343
9	Shale, brick-red, in part silty	7343 - 7352

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Thickness Feet	Description of Strata	Depth in feet
87	Sandstone, very fine grained, grayish-red, argillaceous, with a little interbedded brick-red shale	7352 - 7439
51	Sandstone, very fine grained, variegated, grayish-red and greenish-gray, argillaceous, with a little interbedded brick-red shale	7439 - 7490
24	Sandstone, very fine grained, variegated, grayish-red and greenish-gray, argillaceous	7490 - 7514
13	Sandstone, very fine grained, grayish-red, argillaceous	7514 - 7527
5	Shale, brick-red, silty, with considerable interbedded very fine grained greenish-gray sandstone	7527 - 7532
16	Sandstone, very fine grained, variegated, grayish-red and greenish-gray, argillaceous	7532 - 7548
6	Shale, greenish-gray, silty, with some interbedded brick-red shale	7548 - 7554
8	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	7554 - 7562
16	Sandstone, very fine grained, variegated, greenish- and reddish-gray, with a little interbedded greenish-gray shale	7562 - 7578
8	Shale, brick-red, in part silty, with considerable interbedded very fine grained greenish-gray argillaceous sandstone	7578 - 7586
5	Sandstone, very fine grained, variegated, greenish- and reddish-gray, argillaceous, with a little interbedded brick-red shale	7586 - 7591
	Oswego sandstone, 81 feet	
16	Sandstone, very fine grained, greenish-gray, argillaceous	7591 - 7607
25	Sandstone, very fine grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	7607 - 7632
20	Sandstone, very fine grained, greenish-gray, with some interbedded greenish-gray silty shale	7632 - 7652

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Thickness Feet	Description of Strata	Depth in feet
5	Shale, greenish-gray, in part silty, with a little interbedded very fine grained greenish-gray argillaceous sandstone	7652 - 7657
9	Siltstone, greenish-gray, with some interbedded greenish-gray shale	7657 - 7666
6	Sandstone, very fine grained, greenish-gray, with a little interbedded greenish-gray shale	7666 - 7672
	Reedsville shale, 330+ feet	
21	Siltstone, greenish-gray, with considerable interbedded greenish-gray shale	7672 - 7693
5	Shale, greenish-gray, with considerable interbedded greenish-gray siltstone	7693 - 7698
9	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	7698 - 7707
8	Shale, dark greenish-gray, silty	7707 - 7715
36	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	7715 - 7751
140	Shale, dark-gray, with some interbedded greenish-gray siltstone	7751 - 7891
56	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone containing an occasional shell fragment	7891 - 7947
27	Shale, gray to dark-gray, with some interbedded greenish-gray calcareous siltstone	7947 - 7974
11	Shale, gray, with a little interbedded greenish-gray calcareous siltstone containing occasional fragments of shells and bryozoa	7974 - 7985
17	Shale, gray to dark-gray, with some interbedded greenish-gray calcareous siltstone containing occasional fragments of shells	7985 - 8002
	TOTAL DEPTH	8002

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

BENJAMIN HAYWOOD NO. 1 WELL
ATLANTIC SEABOARD NATURAL GAS COMPANY, INC.

McKean County, Pa., Hamlin Township
Mt. Jewett Quadrangle: 1.58 miles south of 41° 45' N. Lat. and 1.49 miles east of 78° 35' W. Long.
Completed: 1934.
Elevation: 1750 feet above sea level.
Total depth: 5269 feet.
Deepest formation: Salina.
Result: Slight show of oil in Chipmunk sand; 60,000 cubic feet of gas per day, initial open flow, in Upper Kane sand; show of gas in Lower Kane sand. Oriskany sandstone absent. Completed as a small gas well in the Upper Kane sand.
Samples: 930 to 5269 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 5216+ feet	
	Upper Devonian Series, 4654+ feet	
	Bottom of Cattaraugus red beds from driller's log	263
930	No samples	0 - 930
25	Sandstone, very fine grained, greenish-gray, slightly calcareous and fossiliferous, with some interbedded greenish-gray shale, Bradford First sand	930 - 955
38	Shale, gray, with some interbedded very fine grained light greenish-gray fossiliferous sandstone	955 - 993
82	No samples	993 - 1075
6	Sandstone, very fine grained, grayish-brown, slightly calcareous, slight show of OIL at 1081, Chipmunk sand	1075 - 1081
7	Shale, greenish-gray, sandy	1081 - 1088
12	Sandstone, very fine grained, greenish-gray	1088 - 1100

Thickness Feet	Description of Strata	Depth in feet
50	No samples	1100 - 1150
19	Shale, greenish-gray, with some interbedded very fine grained light-gray sandstone	1150 - 1169
63	No samples	1169 - 1232
19	Shale, very fine grained, light-gray, calcareous, fossiliferous in upper part, with a little interbedded gray shale	1232 - 1251
39	No samples	1251 - 1290
13	Shale, dark greenish-gray, sandy, fossiliferous	1290 - 1303
7	Shale, dark-gray, fossiliferous	1303 - 1310
8	Sandstone, very fine grained, light greenish-gray, calcareous	1310 - 1318
8	Shale, dark greenish-gray, sandy, fossiliferous	1318 - 1326
36	No samples	1326 - 1362
8	Shale, gray, sandy, fossiliferous, with some interbedded very fine grained light-gray sandstone	1362 - 1370
30	No samples	1370 - 1400
20	Sandstone, fine-grained, light-gray, somewhat calcareous and fossiliferous, with some interbedded gray sandy shale	1400 - 1420
147	No samples	1420 - 1567
	Top of Bradford Third sand	1567
14	Sandstone, very fine grained, brownish-gray, somewhat calcareous in lower part, with some interbedded gray shale	1567 - 1581
7	Shale, greenish-gray, with some interbedded very fine grained brownish-gray sandstone, somewhat calcareous and fossiliferous	1581 - 1588
12	Sandstone, very fine grained, grayish-brown, somewhat calcareous, with considerable interbedded greenish-gray shale	1588 - 1600

Haywood No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, fine-grained, chocolate-brown, 25,000 cubic feet of GAS per day, open flow	1600 - 1605
6	Sandstone, very fine grained, chocolate-brown	1605 - 1611
	Bottom of Bradford Third sand	1611
24	No samples	1611 - 1635
	Top of Lewis Run sand	1635
21	Sandstone, very fine grained, chocolate-brown, with considerable interbedded greenish-gray fossiliferous sandy shale	1635 - 1656
19	Shale, gray, with some interbedded greenish-gray fossiliferous sandy shale	1656 - 1675
6	Sandstone, fine-grained, chocolate-brown, slightly calcareous	1675 - 1681
	Bottom of Lewis Run sand	1681
139	No samples	1681 - 1820
29	Shale, greenish-gray, with a little interbedded fine-grained chocolate-brown sandstone	1820 - 1849
6	Shale, greenish-gray, sandy	1849 - 1855
16	Sandstone, very fine grained, chocolate-brown, 60,000 cubic feet of GAS per day, open flow, Upper Kane sand	1855 - 1871
49	Shale, in part sandy, gray	1871 - 1920
	Top of Lower Kane sand	1920
7	Sandstone, very fine grained, chocolate-brown, 3,000 cubic feet of GAS per day, open flow	1920 - 1927
12	Shale, dark-gray, sandy, with some interbedded very fine grained chocolate-brown sandstone	1927 - 1939
12	Sandstone, very fine grained, dark chocolate-brown, with considerable interbedded greenish-gray sandy shale	1939 - 1951

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, very fine grained, dark grayish-brown, with some interbedded greenish-gray sandy shale	1951 - 1963
	Bottom of Lower Kane sand	1963
39	Shale, greenish-gray, with some interbedded very fine grained dark grayish-brown sandstone	1963 - 2002
6	Sandstone, very fine grained, dark grayish brown, with some interbedded greenish-gray shale, Haskill sand	2002 - 2008
6	Shale, greenish-gray, sandy, with some interbedded very fine grained dark grayish-brown sandstone	2008 - 2014
82	Shale, greenish-gray, with some interbedded very fine grained dark grayish-brown sandstone	2014 - 2096
72	No samples	2096 - 2168
6	Shale, gray	2168 - 2174
26	Shale, greenish-gray, sandy	2174 - 2200
6	Shale, gray	2200 - 2206
49	No samples	2206 - 2255
5	Shale, dark-gray	2255 - 2260
28	Sandstone, very fine grained, greenish-gray, slightly calcareous, with some interbedded dark-gray shale	2260 - 2288
5	Shale, gray, sandy	2288 - 2293
15	Shale, gray, with a little interbedded very dark-gray, almost black shale	2293 - 2308
5	Sandstone, very fine grained, gray, with some interbedded gray to dark-gray shale	2308 - 2313
18	Shale, greenish-gray, sandy, with considerable interbedded chocolate-brown sandy shale	2313 - 2331
31	Shale, greenish-gray, sandy, with a great deal of interbedded dark-gray shale	2331 - 2362

Haywood No. 1

Thickness Feet	Description of Strata	Depth in feet
246	No samples	2362 - 2608
12	Shale, greenish-gray, sandy, with some interbedded chocolate-brown sandy shale	2608 - 2620
10	Shale, greenish-gray, sandy	2620 - 2630
216	No samples	2630 - 2846
7	Shale, chocolate-brown, sandy	2846 - 2853
21	Shale, greenish-gray, sandy, with some interbedded dark-gray shale	2853 - 2874
438	No samples	2874 - 3312
5	Shale, gray, with some interbedded grayish-black shale	3312 - 3317
7	Sandstone, very fine grained, dark greenish-gray, with some interbedded dark-gray shale	3317 - 3324
20	Shale, gray to very dark-gray	3324 - 3344
6	Shale, dark greenish-gray, sandy	3344 - 3350
2	Sandstone, very fine grained, dark greenish-gray, slightly calcareous	3350 - 3352
5	Shale, dark greenish-gray, sandy	3352 - 3357
8	Shale, gray	3357 - 3365
61	No samples	3365 - 3426
39	Shale, gray, sandy	3426 - 3465
24	Shale, gray, with some interbedded dark-gray shale	3465 - 3489
51	Shale, greenish-gray, sandy, with some interbedded dark-gray shale	3489 - 3540
34	Shale, dark-gray, with some interbedded greenish-gray sandy shale	3540 - 3574
8	Shale, gray, sandy	3574 - 3582
36	Sandstone, very fine grained, gray, with some interbedded dark-gray shale	3582 - 3618

Thickness Feet	Description of Strata	Depth in feet
5	Shale, dark greenish-gray, sandy	3618 - 3623
10	Sandstone, very fine grained, gray to dark greenish-gray, with some interbedded dark-gray shale in upper part	3623 - 3633
6	Shale, dark-gray, sandy	3633 - 3639
37	Shale, dark-gray, with some interbedded greenish-gray sandy shale	3639 - 3676
36	Shale, dark greenish gray, sandy, with some interbedded dark-gray shale	3676 - 3712
31	Sandstone, very fine grained, dark greenish-gray, with some interbedded dark-gray shale	3712 - 3743
7	Shale, very dark gray, with some interbedded grayish-black shale	3743 - 3750
35	No samples	3750 - 3785
43	Shale, dark-gray, with a little interbedded very fine grained dark greenish-gray sandstone	3785 - 3828
8	Shale, dark-gray, sandy	3828 - 3836
7	Sandstone, very fine grained, greenish-gray	3836 - 3843
39	Shale, dark-gray, with some interbedded dark greenish-gray sandy shale	3843 - 3882
18	Shale, dark greenish gray, sandy, with some interbedded dark-gray shale	3882 - 3900
38	Shale, gray, with some interbedded grayish-black shale	3900 - 3938
37	Shale, dark greenish-gray, sandy, with some interbedded dark grayish-brown sandy shale	3938 - 3975
25	Shale, gray, with some interbedded very dark-gray shale	3975 - 4000
13	Shale, dark greenish gray, sandy, with a little interbedded dark grayish-brown sandy shale	4000 - 4013
25	Shale, dark-gray, with some interbedded dark-gray sandy shale	4013 - 4038

Haywood No. 1

Thickness Feet	Description of Strata	Depth in feet
107	No samples	4038 - 4145
10	Shale, very dark gray, with some interbedded dark-gray sandy shale	4145 - 4155
27	Shale, dark-gray	4155 - 4182
22	Shale, gray	4182 - 4204
82	Shale, dark-to very dark-gray, slightly calcareous	4204 - 4286
56	Shale, dark-gray, with some interbedded grayish-black shale	4286 - 4342
14	Shale, very dark gray	4342 - 4356
12	Shale, grayish-black	4356 - 4368
16	Shale, very dark-gray	4368 - 4384
25	Shale, grayish-black	4384 - 4409
39	Shale, very dark-gray	4409 - 4448
6	Shale, very dark brownish-gray, in part calcareous	4448 - 4454
21	Shale, dark-gray	4454 - 4475
30	Shale, very dark-gray	4475 - 4505
9	Shale, very dark-gray, somewhat calcareous	4505 - 4514
59	Shale, grayish-black, somewhat calcareous	4514 - 4573
13	Shale, grayish-black, calcareous	4573 - 4586
7	Shale, grayish-black, somewhat calcareous	4586 - 4593
34	Shale, grayish-black	4593 - 4627
12	Shale, grayish-black, somewhat calcareous	4627 - 4639
15	Shale, grayish-black	4639 - 4654
	Middle Devonian Series, 528 feet	
	Tully limestone, 4 feet	
4	Limestone, very fine, dense, grayish-brown	4654 - 4658

Thickness Feet	Description of Strata	Depth in feet
	Hamilton group, 468 feet	
31	Shale, grayish-black, somewhat calcareous	4658 - 4689
12	Shale, dark-gray, somewhat calcareous, with some interbedded grayish-black shale	4689 - 4701
7	Shale, grayish-black	4701 - 4708
6	Shale, very dark-gray, somewhat calcareous	4708 - 4714
6	Shale, grayish-black, somewhat calcareous	4714 - 4720
5	Shale, dark-gray, somewhat calcareous	4720 - 4725
16	Shale, grayish-black, somewhat calcareous	4725 - 4741
11	Shale, very dark-gray, somewhat calcareous	4741 - 4752
18	Shale, dark-gray, somewhat calcareous	4752 - 4770
22	Shale, dark- to very dark-gray, calcareous	4770 - 4792
10	Shale, very dark-gray, somewhat calcareous	4792 - 4802
38	Shale, dark-gray, somewhat calcareous	4802 - 4840
6	Shale, dark-gray, calcareous	4840 - 4846
39	Shale, dark-gray, somewhat calcareous	4846 - 4885
7	Shale, grayish-black, somewhat calcareous	4885 - 4892
38	Shale, very dark-gray, somewhat calcareous	4892 - 4930
12	Shale, grayish-black, somewhat calcareous	4930 - 4942
18	Shale, very dark-gray, calcareous	4942 - 4960
65	Shale, black	4960 - 5025
54	Shale, black, slightly calcareous	5025 - 5079
35	Shale, black, with abundant minute pyrite crystals	5079 - 5114
9	Shale, grayish-black, calcareous	5114 - 5123
3	Bentonite, brown, micaceous, containing minutely disseminated pyrite, Tioga	5123 - 5126

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 56 feet	
15	Limestone, very fine, clastic, brownish-gray to dark-gray, argillaceous, containing fragments of shells	5126 - 5141
6	Shale, light-gray, calcareous	5141 - 5147
3	Limestone, very fine, crystalline, light-gray, containing some white tripolitic chert and a little light bluish and brownish-gray subchalcedonic chert	5147 - 5150
4	Chert, light-gray to white, semichalcedonic grading into brownish-gray chalcedonic chert, in part calcareous, with considerable interbedded dark-gray to grayish-black calcareous shale	5150 - 5154
2	Shale, brownish-gray, silty, containing a little glauconite	5154 - 5156
5	Chert, light-gray, semichalcedonic, somewhat calcareous	5156 - 5161
7	Shale, gray, silty and slightly calcareous, with considerable interbedded mottled dark-green and grayish-black glauconitic shale	5161 - 5168
2	Limestone, very fine, clastic, brownish-gray, cherty	5168 - 5170
3	Shale, mottled dark-green and grayish-black, glauconitic, with considerable interbedded very fine clastic, brownish-gray cherty limestone	5170 - 5173
3	Limestone, very fine, clastic, light-to dark brownish-gray, cherty, with some interbedded mottled dark-green and grayish-black glauconitic shale	5173 - 5176
3	Shale, dark brownish-gray, very calcareous	5176 - 5179
3	Limestone, fine, clastic, mottled light and dark brownish-gray, argillaceous	5179 - 5182

Thickness Feet	Description of Strata	Depth in feet
	Lower Devonian Series, 34 feet	
	Helderberg limestone, 34 feet	
9	Limestone, very fine to medium, clastic, dark brownish-gray, containing abundant small shell fragments	5182 - 5191
8	Limestone, very fine, dense, dark brownish-gray, somewhat argillaceous	5191 - 5199
5	Limestone, very fine, dense, mottled light and dark brownish-gray, somewhat argillaceous, containing a little drusy quartz	5199 - 5204
12	Limestone, fine, clastic, brownish-gray, containing some light brownish-gray subchalcedonic chert and drusy quartz	5204 - 5216
	SILURIAN SYSTEM, 53+ feet	
	Upper Silurian or Cayugan Series, 53+ feet	
	Cobleskill limestone, 26 feet	
4	Limestone, very fine, dense, brownish-to dark brownish-gray, somewhat argillaceous and magnesian, containing a little brownish-gray chalcedonic chert	5216 - 5220
2	Limestone, very fine, clastic, light-gray, magnesian, and somewhat argillaceous	5220 - 5222
9	Limestone, very fine, dense, gray to brownish-gray, somewhat magnesian	5222 - 5231
11	Limestone, very fine, dense, dark grayish-brown	5231 - 5242
	Salina group, 27+ feet	
	Bertie limestone, 27+ feet	
27	Limestone, very fine, clastic, light-gray to grayish-brown, dolomitic and somewhat argillaceous	5242 - 5269
	TOTAL DEPTH	5269

WELL-SAMPLE RECORD
NO.
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WELL-SAMPLE RECORD

M. ZERBE WELL
POTTER DEVELOPMENT COMPANY, SERIAL NO. 1165

McKean County, Pa., Liberty Township
Smethport Quadrangle: .25 mile south of 41° 50' N. Lat. and 1.37 miles west of 78° 20' W. Long.
Completed: September 3, 1934.
Elevation: 1751 feet above sea level.
Total depth: 5135 feet.
Deepest formation: Salina
Result: 41,000 cubic feet of gas per day, initial open flow from Upper Devonian sands; Oriskany sandstone absent.
Samples: 705 to 4288 feet and 4682 to 5125 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4783+ feet	
	Upper Devonian Series, 4202+ feet	
705	No samples	0 - 705
	Top of Chipmunk sand	705
12	Sandstone, fine-grained, light greenish gray, fossiliferous and slightly calcareous, with some interbedded greenish-gray sandy shale	705 - 717
15	Shale, greenish gray, sandy, with some interbedded fine-grained light greenish-gray sandstone	717 - 732
32	Sandstone, fine-grained, light greenish gray, with some interbedded greenish-gray shale	732 - 764
	Bottom of Chipmunk sand	764
10	Shale, greenish gray, sandy, with some interbedded fine-grained light greenish-gray sandstone	764 - 774
6	Shale, greenish gray, with some interbedded fine-grained light greenish-gray sandstone, fossiliferous	774 - 780
35	Shale, dark greenish gray	780 - 815

Thickness Feet	Description of Strata	Depth in feet
15	Sandstone, fine-grained, light greenish gray, somewhat calcareous and fossiliferous, with some interbedded dark greenish-gray shale; Bradford Second sand	815 - 830
47	Shale, dark greenish gray, with a little interbedded fine-grained grayish-brown sandstone, in part fossiliferous	830 - 877
7	Shale, greenish gray, sandy	877 - 884
6	Sandstone, fine-grained, greenish gray, fossiliferous and calcareous	884 - 890
26	Shale, greenish gray, with some interbedded fine-grained greenish-gray sandstone, somewhat calcareous	890 - 916
	Top of Harrisburg Run sand	916
9	Sandstone, very fine-grained, dark greenish gray, fossiliferous and somewhat calcareous, with some interbedded dark greenish-gray sandy shale	916 - 925
8	Sandstone, fine-grained, light brownish gray, fossiliferous and somewhat calcareous, with considerable interbedded dark greenish-gray shale	925 - 933
7	Sandstone, fine-grained, dark greenish gray, fossiliferous and somewhat calcareous, with considerable interbedded dark greenish-gray shale	933 - 940
	Bottom of Harrisburg Run sand	940
28	Shale, greenish to dark greenish gray	940 - 968
7	Shale, greenish gray, sandy, very fossiliferous	968 - 975
16	Sandstone, very fine-grained, greenish to dark greenish gray, somewhat calcareous, with some interbedded dark greenish-gray shale	975 - 991
26	Shale, dark greenish gray, with a little interbedded very fine-grained greenish-gray sandstone	991 - 1017

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
44	Shale, greenish gray, with some interbedded very fine-grained greenish-gray sandstone in upper part	1017 - 1061
13	Shale, greenish gray, sandy, fossiliferous	1061 - 1074
67	Shale, greenish to dark greenish gray, with a little interbedded very fine-grained light grayish-brown sandstone, slightly calcareous	1074 - 1141
13	Sandstone, very fine-grained, grayish brown, fossiliferous and somewhat calcareous; Bradford Third sand	1141 - 1154
77	Shale, greenish gray, with a little interbedded very fine-grained grayish-brown sandstone, slightly calcareous	1154 - 1231
	Top of Lewis Run sand	1231
25	Sandstone, fine-grained, chocolate brown, somewhat fossiliferous, with some interbedded greenish-gray shale	1231 - 1256
22	Shale, dark greenish gray	1256 - 1278
5	Sandstone, very fine-grained, chocolate brown, somewhat calcareous	1278 - 1283
9	Sandstone, very fine-grained, greenish gray, fossiliferous, with some interbedded greenish-gray sandy shale	1283 - 1292
	Bottom of Lewis Run sand	1292
13	Shale, greenish gray, sandy, fossiliferous, with a little interbedded very fine-grained chocolate-brown sandstone	1292 - 1305
7	Shale, greenish gray	1305 - 1312
13	Shale, greenish gray, sandy, with a little interbedded very fine-grained, chocolate-brown sandstone	1312 - 1325
24	Shale, greenish gray	1325 - 1349
13	Shale, dark greenish gray	1349 - 1362
73	Shale, greenish gray	1362 - 1435

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Thickness Feet	Description of Strata	Depth in feet
28	Shale, dark greenish gray	1435 - 1463
17	Shale, greenish gray, with a little interbedded very fine-grained, greenish-gray sandstone	1463 - 1480
25	Shale, dark greenish gray	1480 - 1505
15	Shale, greenish gray, with some interbedded very fine-grained grayish-brown sandstone	1505 - 1520
	Top of Betula sand	1520
25	Sandstone, fine-grained, grayish brown, somewhat fossiliferous, with some interbedded greenish-gray shale	1520 - 1545
10	Shale, greenish gray, sandy, with some interbedded very fine-grained grayish-brown sandstone	1545 - 1555
26	Shale, dark greenish gray, with some interbedded very fine-grained grayish-brown sandstone	1555 - 1581
9	Sandstone, very fine-grained, grayish brown, with some interbedded greenish-gray shale	1581 - 1590
	Bottom of Betula sand	1590
10	Shale, greenish gray, sandy, with some interbedded brownish-gray sandstone	1590 - 1600
16	Shale, greenish gray, with a little interbedded very fine-grained brownish-gray sandstone	1600 - 1616
36	Shale, greenish gray, sandy, with some interbedded dark-gray shale	1616 - 1652
9	Sandstone, very fine-grained, grayish brown, with considerable interbedded greenish-gray shale; Haskill sand	1652 - 1661
31	Shale, greenish gray, with a little interbedded very fine-grained very dark brownish-gray sandstone	1661 - 1692
36	Shale, greenish gray, sandy, with some interbedded greenish-gray shale	1692 - 1728

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Thickness Feet	Description of Strata	Depth in feet
22	Shale, dark gray	1728 - 1750
7	Shale, greenish gray, sandy, with some interbedded very dark gray, almost black, shale	1750 - 1757
4	Shale, gray to dark gray	1757 - 1761
9	Shale, gray, sandy	1761 - 1770
10	Shale, dark gray	1770 - 1780
160	Shale, greenish gray, with some interbedded greenish-gray sandy shale	1780 - 1940
18	Shale, dark gray, with a little interbedded dark gray sandy shale	1940 - 1958
16	Shale, gray, sandy	1958 - 1974
9	Shale, greenish gray	1974 - 1983
17	Sandstone, very fine-grained, dark greenish gray, with some interbedded dark greenish-gray sandy shale	1983 - 2000
35	Shale, greenish gray, sandy	2000 - 2035
18	Shale, dark greenish gray, sandy	2035 - 2053
38	Shale, greenish gray, sandy	2053 - 2091
25	Shale, dark greenish gray, sandy	2091 - 2116
9	Shale, very dark gray	2116 - 2125
9	Shale, greenish gray	2125 - 2134
10	Shale, greenish gray, sandy, with a little interbedded grayish-black shale	2134 - 2144
22	Sandstone, very fine-grained, greenish gray, somewhat calcareous in lower part	2144 - 2166
8	Shale, dark gray	2166 - 2174
8	Sandstone, fine-grained, greenish gray, with some interbedded dark gray shale	2174 - 2182
24	Shale, greenish gray, sandy, with some interbedded dark gray shale	2182 - 2206

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Thickness Feet	Description of Strata	Depth in feet
14	Shale, dark to very dark gray	2206 - 2220
16	Shale, grayish black	2220 - 2236
24	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale	2236 - 2260
9	Shale, greenish gray, sandy	2260 - 2269
51	Shale, dark greenish gray, sandy	2269 - 2320
5	Shale, gray	2320 - 2325
16	Shale, dark greenish gray, with some interbedded dark gray shale	2325 - 2341
69	Shale, greenish gray, sandy	2341 - 2410
10	Sandstone, very fine-grained, light greenish gray, with some interbedded dark greenish-gray sandy shale	2410 - 2420
10	Shale, dark greenish gray	2420 - 2430
8	Shale, dark greenish gray, sandy	2430 - 2438
15	Shale, dark greenish gray	2438 - 2453
7	Sandstone, very fine-grained, greenish gray, slightly calcareous, with some interbedded dark gray shale	2453 - 2460
20	Shale, greenish gray, sandy, with a little interbedded dark gray shale	2460 - 2480
38	Shale, greenish gray, sandy, with a little interbedded grayish-black shale	2480 - 2518
13	Shale, dark greenish gray, sandy	2518 - 2531
19	Shale, dark gray, sandy, with some interbedded grayish-black shale	2531 - 2550
26	Shale, dark greenish gray, sandy	2550 - 2576
8	Shale, dark greenish gray, sandy, with some interbedded grayish-black shale	2576 - 2584
28	Shale, dark greenish gray, sandy	2584 - 2612

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Thickness Feet	Description of Strata	Depth in feet
9	Shale, gray to dark gray	2612 - 2621
9	Shale, dark greenish gray, sandy	2621 - 2630
10	Shale, dark greenish gray, sandy, with some interbedded grayish black shale	2630 - 2640
24	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	2640 - 2664
21	Shale, gray to dark gray	2664 - 2685
15	Shale, greenish gray, sandy, with a little interbedded grayish-black shale in lower part	2685 - 2700
36	Shale, dark greenish gray, sandy, with a little interbedded dark gray shale	2700 - 2736
10	Shale, greenish gray, sandy	2736 - 2746
26	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	2746 - 2772
7	Shale, dark gray, with some interbedded grayish-black shale	2772 - 2779
18	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	2779 - 2797
11	Shale, dark greenish gray, sandy, with some interbedded grayish-black shale	2797 - 2808
54	Shale, greenish gray, sandy, with some interbedded dark gray shale	2808 - 2862
23	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	2862 - 2885
15	Sandstone, very fine-grained, light gray, with a little interbedded gray shale	2885 - 2900
46	Shale, greenish gray, sandy, with some interbedded dark gray shale	2900 - 2946
6	Shale, grayish brown, sandy, with some interbedded gray shale	2946 - 2952
8	Sandstone, very fine-grained, greenish and brownish gray, with some interbedded dark gray shale	2952 - 2960

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
38	Shale, dark gray, with some interbedded dark greenish-gray sandy shale	2960 - 2998
20	Shale, dark greenish gray, sandy	2998 - 3018
42	Shale, greenish gray, sandy, with some interbedded gray shale	3018 - 3060
10	Sandstone, very fine-grained, light greenish gray, with some interbedded gray shale	3060 - 3070
8	Shale, greenish gray, sandy, with some interbedded gray shale	3070 - 3078
7	Sandstone, very fine-grained, greenish gray, with some interbedded gray shale	3078 - 3085
20	Shale, greenish gray, sandy, somewhat fossiliferous, with some interbedded gray shale	3085 - 3105
20	Shale, greenish gray, sandy, with some interbedded dark gray shale	3105 - 3125
60	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	3125 - 3185
8	Shale, dark gray	3185 - 3193
12	Shale, dark gray, sandy	3193 - 3205
28	Shale, dark to very dark gray, with some interbedded dark gray sandy shale	3205 - 3233
7	Shale, gray to dark gray, with a little interbedded grayish-black shale	3233 - 3240
43	Shale, gray to dark gray	3240 - 3283
7	Shale, dark greenish gray, sandy	3283 - 3290
51	Shale, dark to very dark gray	3290 - 3341
17	Shale, gray, with a little interbedded grayish-black shale	3341 - 3358
15	Shale, gray	3358 - 3373
10	Shale, grayish black	3373 - 3383
19	Shale, gray, sandy, with some interbedded dark gray shale	3383 - 3402

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
48	Shale, gray to dark gray	3402 - 3450
9	Shale, greenish gray, in part sandy, with some interbedded grayish-black shale	3450 - 3459
40	Shale, dark gray	3459 - 3499
24	Sandstone, very fine-grained, dark brownish gray, with some interbedded dark gray shale	3499 - 3523
44	Shale, dark gray, with a little interbedded grayish-black shale	3523 - 3567
59	Shale, dark to very dark gray	3567 - 3626
12	Shale, grayish black	3626 - 3638
38	Shale, dark gray	3638 - 3676
49	Shale, gray, slightly calcareous	3676 - 3725
31	Shale, dark gray	3725 - 3756
9	Shale, dark gray, with a little interbedded grayish-black shale	3756 - 3765
23	Shale, dark gray	3765 - 3788
8	Shale, dark gray, with some interbedded grayish-black shale	3788 - 3796
20	Shale, dark to very dark gray	3796 - 3816
9	Shale, gray, with a little interbedded grayish-black shale	3816 - 3825
10	Shale, dark to very dark gray	3825 - 3835
30	Shale, grayish black, with some interbedded dark gray shale	3835 - 3865
17	Shale, very dark gray	3865 - 3882
8	Shale, grayish black	3882 - 3890
8	Shale, very dark gray	3890 - 3898
28	Shale, grayish black	3898 - 3926
12	Shale, dark to very dark gray	3926 - 3938

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
12	Shale, grayish black	3938 - 3950
57	Shale, dark to very dark gray, with some interbedded grayish-black shale	3950 - 4007
66	Shale, very dark gray, slightly calcareous	4007 - 4073
4	Limestone, very fine, dense, dark brownish gray; Genundewa	4073 - 4077
10	Shale, very dark gray, with some interbedded grayish-black shale, somewhat calcareous	4077 - 4087
36	Shale, grayish black, calcareous	4087 - 4123
36	Shale, grayish black	4123 - 4159
28	Shale, grayish black, somewhat calcareous	4159 - 4187
15	Shale, grayish black, slightly calcareous	4187 - 4202
	Middle Devonian Series, 524 feet	
	Tully limestone, 18 feet	
8	Limestone, very fine, dense, grayish brown	4202 - 4210
7	Shale, grayish black, somewhat calcareous	4210 - 4217
3	Limestone, very fine, dense, grayish brown	4217 - 4220
	Hamilton group, 458 feet	
66	Shale, very dark gray, slightly calcareous	4220 - 4286
2	Limestone, very fine, dense, light grayish brown	4286 - 4288
394	No samples	4288 - 4682
	Onondaga limestone, 48 feet	
	Top of Onondaga limestone from drillers' log	4678
9	Limestone, very fine, dense, very dark brownish gray, argillaceous	4682 - 4691
9	Limestone, very fine, crystalline, light greenish gray to very dark brownish gray, siliceous	4691 - 4700

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
5	Limestone, very fine, crystalline, light to dark brownish gray, siliceous	4700 - 4705
21	Limestone, very fine, crystalline, dark grayish brown, cherty	4705 - 4726
	Lower Devonian Series, 57 feet	
	Helderberg group, 57 feet	
11	Limestone, very fine, crystalline, grayish to dark grayish brown, somewhat siliceous	4726 - 4737
27	Limestone, very fine, crystalline, brownish to very dark brownish gray, somewhat argillaceous	4737 - 4764
19	Limestone, very fine, dense, very dark brownish gray, argillaceous	4764 - 4783
	SILURIAN SYSTEM, 352+ feet	
	Upper Silurian or Cayugan Series, 352+ feet	
	Cobleskill limestone, 25 feet	
25	Limestone, very fine, crystalline, light gray to grayish brown, somewhat argillaceous, magnesian	4783 - 4808
	Salina group, 327 feet	
12	Limestone, very fine, dense, light grayish brown, argillaceous, magnesian, with some interbedded anhydrite	4808 - 4820
12	Limestone, very fine, crystalline, dark brownish gray, argillaceous, magnesian	4820 - 4832
5	Anhydrite, very fine, crystalline, light gray, with some associated very dark grayish-brown limestone	4832 - 4837
48	Limestone, very fine, dense, very dark brownish gray, argillaceous, with some interbedded anhydrite	4837 - 4885
7	Limestone, very fine, dense, greenish gray, argillaceous, with a little interbedded anhydrite	4885 - 4892

Zerbe, Company Well No. 1165

Thickness Feet	Description of Strata	Depth in feet
27	Limestone, very fine, dense, dark brownish gray, argillaceous, with a little interbedded anhydrite	4892 - 4919
7	Shale, dark gray, somewhat calcareous, with considerable interbedded anhydrite	4919 - 4926
109	Limestone, very fine, dense, brown to dark brown, argillaceous and somewhat magnesian, with some interbedded anhydrite	4926 - 5035
7	Shale, very dark brownish gray, almost black, calcareous, with considerable interbedded anhydrite	5035 - 5042
31	Limestone, very fine, dense, brown to dark brown, argillaceous and somewhat magnesian, with some interbedded anhydrite	5042 - 5073
22	Salt, medium-grained, crystalline, light gray	5073 - 5095
30	Shale, light gray, calcareous, with a little interbedded anhydrite	5095 - 5125
10	No samples	5125 - 5135
	TOTAL DEPTH	5135

WELL-SAMPLE RECORD

NO.

20

SAMPLE DESCRIPTION

GLENN TAYLOR NO. 1 WELL
NEW PENN DEVELOPMENT CORPORATION, SERIAL NO. 1649

McKean County, Pa., Ceres Township
Smethport Quadrangle: 2.30 miles south of 42° 00' N. Lat. and 1.55 miles west of 78° 15' W. Long.
Completed: February 17, 1939.
Elevation: 1555 feet above sea level.
Total depth: 4701 feet.
Deepest formation: Salina.
Result: Show of gas at 1127 feet in Bradford Third sand. No sandstone in Oriskany formation.
Samples: 100 to 4701 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4579+ feet	
	Upper Devonian Series, 3993+ feet	
	Conneaut group, 511+ feet	
100	No samples	0 - 100
75	Shale, greenish-gray, sandy, containing a little muscovite, with some interbedded greenish-gray shale	100 - 175
	Top of "pink rock"	175
17	Shale, greenish-gray, sandy, with some interbedded dark purplish-gray sandy shale	175 - 192
19	Shale, dark purplish-gray, sandy, with considerable interbedded dark greenish-gray sandy shale	192 - 211
14	Shale, dark greenish-gray, sandy	211 - 225
12	Shale, dark greenish-gray, sandy, with some interbedded dark purplish-gray, sandy shale	225 - 237
18	Shale, dark purplish-gray, sandy, with considerable interbedded dark greenish-gray sandy shale	237 - 255

Thickness Feet	Description of Strata	Depth in feet
17	Shale, dark greenish-gray, in part sandy, with some interbedded dark purplish-gray sandy shale, containing an occasional shell fragment	255 - 272
7	Shale, dark purplish-gray, sandy, with considerable interbedded dark greenish-gray, slightly calcareous shale	272 - 279
16	Shale, greenish-gray, in part sandy, with some interbedded dark purplish-gray sandy shale	279 - 295
11	Siltstone, greenish-gray, slightly calcareous, with some interbedded greenish-gray shale	295 - 306
9	Shale, greenish-gray, in part sandy, with a little interbedded red ferruginous sandstone, containing an occasional shell fragment	306 - 315
	Bottom of "pink rock"	315
10	Shale, greenish-gray, in part sandy	315 - 325
10	Siltstone, greenish-gray, with considerable interbedded greenish-gray shale	325 - 335
10	Shale, greenish-gray, sandy and slightly calcareous	335 - 345
63	Siltstone, greenish-gray, slightly calcareous, with some interbedded greenish-gray shale	345 - 408
32	Shale, greenish-gray, 9 5/8 inch casing set at 412 feet	408 - 440
24	Siltstone, greenish-gray, with considerable interbedded dark greenish-gray shale	440 - 464
6	Shale, dark greenish-gray	464 - 470
10	Siltstone, light greenish-gray, slightly calcareous, containing fragments of shells, with considerable interbedded dark greenish-gray shale	470 - 480
25	Shale, greenish-gray	480 - 505
6	Siltstone, light greenish-gray	505 - 511

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
	Canadaway group, 1634 feet	
19	Shale, dark greenish-gray, with considerable interbedded light greenish-gray siltstone	511 - 530
30	Siltstone, light greenish-gray, with considerable interbedded greenish-gray shale	530 - 560
28	Shale, greenish-gray, with some interbedded greenish-gray siltstone	560 - 588
7	Shale, dark-gray, with a little interbedded greenish-gray siltstone	588 - 595
18	Shale, greenish-gray, sandy, containing a few fragments of shells	595 - 613
35	Shale, greenish-gray, with a little interbedded greenish-gray siltstone containing a little biotite and muscovite and an occasional shell fragment	613 - 648
15	Siltstone, chocolate-brown and greenish-gray, with some interbedded greenish-gray shale	648 - 663
50	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	663 - 713
5	Shale, greenish-gray, with considerable interbedded very fine grained, light greenish-gray sandstone containing a little muscovite	713 - 718
26	Shale, greenish-gray, with some interbedded very fine grained, light greenish-gray sandstone containing abundant fragments of shells	718 - 744
12	Shale, greenish-gray, with some interbedded greenish-gray siltstone containing fragments of shells	744 - 756
	Top of Bradford Second sand	756
4	Sandstone, very fine grained, light greenish-gray, containing abundant fragments of shells	756 - 760
22	Sandstone, very fine grained, light brownish- and greenish-gray, containing fragments of shells, with a great deal of interbedded greenish-gray shale	760 - 782
	Bottom of Bradford Second sand	782

Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish-gray	782 - 800
40	Shale, greenish-gray, with a little interbedded very fine grained, light-gray sandstone containing fragments of shells	800 - 840
70	Shale, greenish-gray, with some interbedded very fine grained light greenish-gray sandstone containing abundant fragments of shells	840 - 910
15	Shale, greenish-gray, with considerable interbedded very fine grained light greenish-gray sandstone	910 - 925
15	Sandstone, very fine grained, light-gray, slightly calcareous, with some interbedded greenish-gray shale	925 - 940
50	Shale, greenish-gray, with a little interbedded very fine grained, light-gray sandstone	940 - 990
45	Shale, greenish-gray	990 - 1035
	Top of Lower Richburg Stray sand	1035
10	Sandstone, very fine grained, light grayish-brown, moderately friable, containing a little muscovite and fragments of shells	1035 - 1045
7	Sandstone, very fine grained, light grayish-brown, slightly calcareous and moderately hard, with a little interbedded very fine grained, light greenish-gray, somewhat calcareous sandstone and a little greenish-gray shale	1045 - 1052
	Bottom of Lower Richburg Stray sand	1052
26	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1052 - 1078
	Top of Bradford Third sand	1078
27	Siltstone, chocolate-brown, with considerable interbedded greenish-gray shale	1078 - 1105
20	Shale, greenish-gray, with a little interbedded chocolate-brown siltstone	1105 - 1125
38	Shale, greenish-gray, with some interbedded chocolate-brown slightly calcareous siltstone, show of GAS at 1127 feet	1125 - 1163

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
	Bottom of Bradford Third sand	1163
7	Shale, greenish-gray	1163 - 1170
10	Shale, greenish-gray, with considerable interbedded chocolate-brown siltstone	1170 - 1180
57	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1180 - 1237
11	Sandstone, very fine grained, chocolate-brown, moderately friable, containing fragments of shells in upper part, with considerable interbedded greenish-gray shale, Lewis Run sand	1237 - 1248
32	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1248 - 1280
6	Siltstone, chocolate-brown, with some interbedded greenish-gray shale	1280 - 1286
44	Shale, greenish-gray, with some interbedded chocolate-brown and greenish-gray siltstone	1286 - 1330
28	Sandstone, very fine-grained, light grayish-brown, with considerable interbedded gray shale, Lower Kane sand	1330 - 1358
8	Siltstone, grayish-brown, with considerable interbedded gray shale	1358 - 1366
6	Shale, gray	1366 - 1372
7	Shale, gray, with considerable interbedded very fine grained, grayish-brown sandstone	1372 - 1379
26	Shale, gray to dark-gray	1379 - 1405
14	Shale, gray, with a little interbedded very fine grained, light-gray sandstone	1405 - 1419
23	Shale, gray, with a little interbedded greenish-gray siltstone	1419 - 1442
53	Shale, dark-gray, with considerable interbedded grayish-brown and greenish-gray siltstone	1442 - 1495
23	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	1495 - 1518

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Siltstone, greenish-gray	1518 - 1523
14	Shale, gray	1523 - 1537
30	Shale, gray, with some interbedded chocolate-brown siltstone	1537 - 1567
37	Shale, gray, with a little interbedded dark grayish-brown and greenish-gray siltstone	1567 - 1604
16	Siltstone, greenish-gray, with some interbedded grayish-brown siltstone and gray shale	1604 - 1620
20	Siltstone, greenish-gray, with considerable interbedded dark-gray shale	1620 - 1640
95	Shale, gray to dark-gray, with a little interbedded gray siltstone	1640 - 1735
30	Shale, greenish-gray, sandy, with considerable interbedded dark-gray shale	1735 - 1765
29	Shale, gray, with some interbedded greenish-gray siltstone	1765 - 1794
44	Siltstone, greenish-gray, with considerable interbedded gray shale	1794 - 1838
23	Shale, gray, with considerable interbedded greenish-gray siltstone	1838 - 1861
39	Shale, gray, with considerable interbedded greenish-gray sandy shale	1861 - 1900
29	Siltstone, dark greenish-gray, slightly calcareous	1900 - 1929
20	Shale, dark greenish-gray, sandy and slightly calcareous	1929 - 1949
35	Shale, greenish-gray, sandy, with considerable interbedded gray shale	1949 - 1984
61	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	1984 - 2045
40	Siltstone, greenish-gray, with considerable interbedded dark-gray shale	2045 - 2085
10	Shale, dark-gray	2085 - 2095
30	Shale, grayish-black	2095 - 2125

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Siltstone, greenish-gray, slightly calcareous, with some interbedded grayish-black shale and some gray shale	2125 - 2145
	Bottom of Canadaway group	2145
40	Shale, dark to very dark gray, with considerable interbedded greenish-gray, slightly calcareous shale	2145 - 2185
157	Shale, greenish-gray, sandy, with some interbedded dark-gray shale	2185 - 2342
58	Shale, dark-gray, with some interbedded greenish-gray sandy shale	2342 - 2400
25	Shale, very dark gray, with considerable interbedded greenish-gray sandy shale	2400 - 2425
30	Shale, dark-gray, with some interbedded greenish-gray sandy shale	2425 - 2455
40	Shale, greenish-gray, sandy, with considerable interbedded dark to very dark gray shale	2455 - 2495
37	Shale, dark-gray, with some interbedded greenish-gray sandy shale	2495 - 2532
43	Shale, greenish-gray, sandy, with considerable interbedded dark to very dark gray shale	2532 - 2575
40	Shale, dark to very dark gray, with some interbedded greenish-gray sandy shale	2575 - 2615
41	Shale, dark greenish-gray, sandy, with considerable interbedded dark to very dark gray shale	2615 - 2656
79	Shale, dark to very dark gray, with some interbedded dark greenish-gray sandy shale	2656 - 2735
80	Shale, dark-gray, with considerable interbedded greenish-gray sandy shale	2735 - 2815
9	Siltstone, grayish-brown, containing a little muscovite, with a great deal of interbedded dark-gray shale	2815 - 2824
11	Shale, dark-gray, with some interbedded dark greenish-gray sandy shale	2824 - 2835

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Siltstone, chocolate-brown, containing a little muscovite, with some interbedded dark-gray shale	2835 - 2845
30	Shale, dark-gray, with some interbedded chocolate-brown siltstone	2845 - 2875
20	Shale, dark-gray, with considerable interbedded greenish-gray, sandy shale and a little chocolate-brown siltstone	2875 - 2895
20	Shale, dark-gray, with considerable interbedded greenish-gray sandy shale	2895 - 2915
59	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	2915 - 2974
16	Shale, gray, with some interbedded grayish-black shale and some greenish-gray siltstone	2974 - 2990
110	Shale, gray to dark-gray, with a little interbedded gray sandy shale	2990 - 3100
49	Shale, dark to very dark gray, with a little interbedded greenish-gray siltstone	3100 - 3149
11	Siltstone, greenish-gray, with considerable interbedded dark-gray shale	3149 - 3160
38	Shale, dark to very dark gray	3160 - 3198
46	Shale, dark-gray, with some interbedded grayish-black shale and a little greenish-gray siltstone	3198 - 3244
71	Shale, dark to very dark gray, with some interbedded greenish-gray siltstone	3244 - 3315
81	Shale, dark to very dark gray	3315 - 3396
9	Shale, grayish-black, with some interbedded dark-gray shale	3396 - 3405
32	Shale, very dark gray	3405 - 3437
13	Shale, grayish-black, with some interbedded dark-gray shale	3437 - 3450
30	Shale, very dark gray, with some interbedded grayish-black shale	3450 - 3480
106	Shale, dark-gray	3480 - 3586

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
29	Shale, dark-gray, with some interbedded grayish-black shale	3586 - 3615
10	Shale, dark-gray	3615 - 3625
20	Shale, grayish-black	3625 - 3645
65	Shale, grayish-black, with some interbedded very dark gray shale	3645 - 3710
20	Shale, grayish-black	3710 - 3730
20	Shale, grayish-black, with some interbedded dark-gray shale	3730 - 3750
35	Shale, very dark gray, with some interbedded grayish-black shale	3750 - 3785
11	Shale, grayish-black, with considerable interbedded very dark gray shale	3785 - 3796
19	Shale, very dark gray, with some interbedded grayish-black shale	3796 - 3815
30	Shale, very dark gray, slightly calcareous	3815 - 3845
66	Shale, brownish-black, somewhat calcareous	3845 - 3911
29	Shale, grayish-black, somewhat calcareous	3911 - 3940
20	Shale, black	3940 - 3960
20	Shale, black, somewhat calcareous	3960 - 3980
13	Shale, black	3980 - 3993
	Middle Devonian Series, 569 feet	
	Tully limestone, 47 feet	
30	Limestone, very fine, dense, dark brownish-gray, argillaceous	3993 - 4023
9	Limestone, very fine, dense, dark brownish-gray, argillaceous, with considerable interbedded very dark gray, slightly calcareous shale	4023 - 4032
8	Shale, very dark gray, slightly calcareous, with considerable interbedded very fine, dense, dark brownish-gray, argillaceous limestone	4032 - 4040

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
	Hamilton group, 486 feet	
45	Shale, grayish-black, somewhat calcareous	4040 - 4085
15	Shale, grayish-black, slightly calcareous, with a little interbedded very fine, dense, light brownish-gray limestone	4085 - 4100
58	Shale, very dark gray, slightly calcareous, with a little interbedded very fine, dense, light brownish-gray limestone	4100 - 4158
67	Shale, very dark gray, slightly calcareous	4158 - 4225
55	Shale, very dark gray, somewhat calcareous	4225 - 4280
72	Shale, grayish-black, slightly calcareous	4280 - 4352
48	Shale, very dark gray, somewhat calcareous	4352 - 4400
30	Shale, very dark gray, somewhat calcareous, with considerable interbedded grayish-black shale and a very little very fine, dense, grayish-brown limestone	4400 - 4430
20	Shale, very dark brownish-gray to black, somewhat calcareous	4430 - 4450
15	Shale, very dark gray, somewhat calcareous	4450 - 4465
29	Shale, grayish-black, with some interbedded very dark brownish-gray, somewhat calcareous shale	4465 - 4494
32	Shale, black, calcareous	4494 - 4526
	Onondaga limestone, 36 feet	
18	Limestone, very fine, dense, very dark brownish-gray, almost black, argillaceous, containing occasional shell fragments	4526 - 4544
18	Limestone, very fine, dense, dark brownish-gray, argillaceous, containing a very little light-gray chert in lower part	4544 - 4562
	Lower Devonian Series, 17 feet	
	Oriskany formation, 17 feet	
11	Limestone, very fine, dense, dark brownish-gray, containing a few fine- to medium-grained, rounded and frosted quartz grains and some very fine angular quartz grains and an occasional shell fragment	4562 - 4573

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Limestone, very fine, crystalline, dark brownish-gray, containing some very fine, angular quartz grains	4573 - 4579
	SILURIAN SYSTEM, 122 feet	
	Upper Silurian or Cayugan Series, 122 feet	
	Cobleskill limestone, 23 feet	
23	Limestone, very fine, dense, dark to very dark brownish-gray, somewhat argillaceous and silty and somewhat magnesian	4579 - 4602
	Salina formation, 99 feet	
	Top of Bertie limestone	4602
10	Limestone, very fine, dense, light brownish-gray, argillaceous and somewhat magnesian	4602 - 4612
7	Limestone, very fine, dense, light- to dark brownish-gray, argillaceous and somewhat magnesian	4612 - 4619
26	Limestone, very fine, dense, dark to very dark brownish-gray, argillaceous and somewhat magnesian	4619 - 4645
	Bottom of Bertie Limestone	4645
10	Limestone, very fine, dense, light grayish-brown, argillaceous and dolomitic, containing some very fine, crystalline, light-gray anhydrite	4645 - 4655
5	Limestone, very fine, dense, grayish- to dark grayish-brown, argillaceous and dolomitic, containing considerable very fine, crystalline, light-gray anhydrite	4655 - 4660
30	Anhydrite, very fine, crystalline, with considerable associated very fine, dense, very dark brownish-gray argillaceous and dolomitic limestone	4660 - 4690
11	Limestone, very fine, dense, dark grayish-brown, dolomitic and somewhat argillaceous, containing considerable anhydrite	4690 - 4701
	TOTAL DEPTH	4701

WELL-SAMPLE RECORD

NO.

21

WELL-SAMPLE RECORD

E. COLLINS NO. 1 WELL
W. C. WASSON ET AL.

Forest County, Howe Township, Warrant 3189
Sheffield Quadrangle: .19 mile south of 41° 35' N. Lat. and 1.17 miles west of 79° 05' W. Long.
Completed: October 10, 1938.
Elevation: 1830 feet above sea level.
Total depth: 5349 feet.
Deepest formation: Helderberg.
Result: Show of oil at 2030 to 2055 feet in Cooper sand; gas pockets at 5057, 5067, 5070, and 5074; 7 small gas pockets, 5075-5088; show of distillate and salt water at 5202 to 5204 feet in bottom of Oriskany. Well abandoned.
Samples: 700 to 5349 feet examined by Chas R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
700	No samples	0 - 700
	PENNSYLVANIAN SYSTEM, 107+ feet	
	Upper Pottsville-Kanawha Series, 107+ feet	
	From drillers' log	
20	Mud shale	0 - 20
87	White sand	20 - 107
	MISSISSIPPIAN SYSTEM, 361 feet	
	Pocono group, 361 feet	
8	Slate	107 - 115
20	White sand	115 - 135
290	Slate and sand shells	135 - 425
43	White sand	425 - 468

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4881 feet	
	Upper Devonian Series, 4318 feet	
	Conewango group, 528 feet	
	Oswayo formation, 182 feet	
7	Slate	468 - 475
175	Sand, shells and slate	475 - 650
	Cattaraugus formation, 346 feet	
50	Red rock, shells and slate	650 - 700
	From well-sample examination	
24	Sandstone, medium-grained, light gray, somewhat calcareous, with some interbedded greenish-gray sandy shale and a little brick-red sandy shale	700 - 724
34	Shale, brick red, sandy, with considerable interbedded greenish-gray sandy shale and a little fine-grained light greenish-gray somewhat calcareous sandstone	724 - 758
24	Shale, dark greenish gray, sandy, containing minute fragments of carbonized plant remains	758 - 782
16	Shale, brick red, sandy, somewhat calcareous, with a little interbedded greenish-gray sandy shale	782 - 798
32	Shale, dark brick red, with considerable interbedded greenish-gray sandy shale	798 - 830
19	Sandstone, fine-grained, greenish gray, slightly calcareous, containing a little muscovite, with some interbedded dark greenish-gray sandy shale	830 - 849
18	Shale, dark purplish red, sandy, with considerable interbedded dark greenish-gray sandy shale	849 - 867
49	Shale, greenish gray, with some interbedded medium- to coarse-grained light-gray sandstone containing a few well-rounded quartz pebbles up to 5 mm. in diameter	867 - 916

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Shale, greenish gray, in part sandy, with a little interbedded dark purplish-red shale	916 - 932
48	Shale, brick red, sandy, with some interbedded fine-grained light greenish-gray slightly calcareous sandstone	932 - 980
16	Shale, dark brick red, sandy, with some interbedded greenish-gray sandy shale	980 - 996
	Conneaut group, 659 feet	
118	Shale, dark greenish gray, sandy	996 - 1114
	Top of "pink rock"	1114
16	Shale, dark purplish gray, sandy and slightly calcareous, with some interbedded dark greenish-gray sandy shale containing fragments of shells	1114 - 1130
16	Shale, dark purplish gray, sandy, containing fragments of shells	1130 - 1146
50	Shale, dark purplish gray, sandy, with some interbedded dark greenish-gray sandy shale containing fragments of shells	1146 - 1196
113	Shale, dark greenish gray, sandy, containing fragments of shells, with a little interbedded dark purplish-gray shale	1196 - 1309
18	Shale, dark greenish gray, sandy and micaceous, slightly calcareous, with some interbedded dark-gray shale	1309 - 1327
16	Shale, dark greenish gray, sandy, with considerable interbedded purplish-red shale	1327 - 1343
48	Shale, dark greenish gray, sandy; containing fragments of shells, with some interbedded dark purplish-gray shale, in part sandy	1343 - 1391
25	Shale, dark purplish gray; sandy, containing fragments of shells, with considerable interbedded dark greenish-gray sandy shale	1391 - 1416
	Bottom of "pink rock"	1416

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
27	Shale, dark greenish gray, in part sandy, with some interbedded very fine grained greenish-gray sandstone containing fragments of shells	1416 - 1443
62	Shale, dark greenish gray, with some interbedded dark greenish-gray sandy shale	1443 - 1505
	Top of Second Warren sand	1505
8	Sandstone, fine-grained, light greenish gray, with considerable interbedded gray shale	1505 - 1513
25	Sandstone, fine-grained, light greenish gray, with some interbedded gray shale	1513 - 1538
17	Sandstone, fine-grained, light greenish gray, with considerable interbedded gray shale	1538 - 1555
	Bottom of Second Warren sand	1555
63	Shale, dark greenish gray, in part sandy	1555 - 1618
6	Sandstone, very fine grained, greenish gray, somewhat calcareous, containing some muscovite and fragments of shells, with some interbedded dark greenish-gray shale	1618 - 1624
8	Shale, dark greenish to purplish gray, sandy	1624 - 1632
16	Shale, dark greenish gray, sandy, containing fragments of shells	1632 - 1648
7	Sandstone, very fine grained, light greenish gray, slightly calcareous, containing some muscovite, with a little interbedded gray shale; Glade sand	1648 - 1655
	Canadaway group, 1592 feet	
43	Shale, dark gray	1655 - 1698
48	Shale, dark greenish gray, with some interbedded greenish-gray sandy shale	1698 - 1746
48	Shale, dark greenish gray, with a little interbedded very fine grained greenish-gray sandstone	1746 - 1794

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Sandstone, fine-grained, light greenish gray, containing a few rounded quartz grains up to 2 mm. in diameter, with considerable interbedded dark greenish-gray shale; Balltown sand	1794 - 1810
8	Shale, greenish gray	1810 - 1818
16	Shale, dark greenish gray, with some interbedded very fine grained greenish-gray sandstone	1818 - 1834
8	Sandstone, very fine grained, light greenish gray, with considerable interbedded dark greenish-gray shale	1834 - 1842
16	Shale, dark greenish gray, with considerable interbedded very fine grained light greenish-gray sandstone	1842 - 1858
8	Sandstone, very fine grained, light greenish gray, with some interbedded dark greenish-gray shale	1858 - 1866
8	Sandstone, very fine grained, greenish gray, with considerable interbedded dark greenish-gray shale	1866 - 1874
8	Sandstone, fine-grained, light greenish gray, with some interbedded dark greenish-gray shale	1874 - 1882
24	Shale, dark greenish gray, with some interbedded very fine grained light greenish-gray sandstone	1882 - 1906
50	Shale, dark greenish gray, with a little interbedded very fine grained greenish-gray sandstone	1906 - 1956
32	Shale, dark greenish gray	1956 - 1988
24	Shale, dark greenish gray, with considerable interbedded very fine grained light greenish-gray sandstone containing a few shell fragments	1988 - 2012
	Top of Cooper sand	2012
14	Sandstone, very fine grained, dark greenish to brownish gray, slightly calcareous, with considerable interbedded dark-gray shale	2012 - 2026

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine grained, chocolate brown, with some interbedded greenish-gray sandy shale containing an occasional shell fragment	2026 - 2032
8	Sandstone, very fine grained, greenish to brownish gray, slightly calcareous, with some interbedded greenish-gray shale	2032 - 2040
10	Sandstone, very fine grained, light grayish brown, slightly calcareous	2040 - 2050
25	Sandstone, very fine grained, light greenish and brownish gray, slightly calcareous, containing an occasional shell fragment; show of OIL, 2030 to 2055	2050 - 2075
	Bottom of Cooper sand	2075
17	Shale, dark greenish gray, with considerable interbedded very fine grained light brownish-gray sandstone	2075 - 2092
31	Shale, dark greenish gray, with a little interbedded very fine grained greenish-gray sandstone	2092 - 2123
33	Shale, dark greenish gray	2123 - 2156
16	Sandstone, very fine grained, light greenish gray, slightly calcareous, with considerable interbedded dark greenish-gray shale	2156 - 2172
16	Shale, greenish gray, with some interbedded very fine grained light greenish-gray sandstone	2172 - 2188
8	Sandstone, very fine grained, greenish gray, slightly calcareous, with some interbedded dark greenish-gray shale	2188 - 2196
14	Shale, dark greenish gray, with considerable interbedded very fine grained greenish-gray slightly calcareous sandstone, containing an occasional shell fragment	2196 - 2210
6	Shale, dark greenish gray, sandy	2210 - 2216
11	Sandstone, very fine grained, greenish gray, somewhat calcareous, with considerable interbedded dark greenish-gray shale	2216 - 2227

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
45	Shale, dark gray, with a little interbedded very fine grained greenish-gray sandstone	2227 - 2272
32	Shale, dark gray, with some interbedded gray slightly calcareous siltstone	2272 - 2304
78	Shale, greenish to dark greenish gray, sandy, containing fragments of shells	2304 - 2382
34	Shale, gray, with some interbedded greenish-gray sandy shale	2382 - 2416
42	Shale, gray to greenish gray, with a little interbedded greenish-gray siltstone	2416 - 2458
42	Shale, gray, in part sandy	2458 - 2500
5	Sandstone, very fine grained, dark chocolate brown; show of GAS, burned 5 feet from 8-inch hole	2500 - 2505
49	Shale, dark gray, in part sandy	2505 - 2554
34	Shale, dark gray, with some interbedded very fine grained light-gray slightly calcareous sandstone	2554 - 2588
42	Shale, dark gray	2588 - 2630
21	Shale, gray	2630 - 2651
74	Shale, gray, sandy, with some interbedded dark-gray shale	2651 - 2725
57	Shale, dark gray, with a little interbedded very fine grained light greenish-gray slightly calcareous sandstone	2725 - 2782
5	Sandstone, very fine grained, greenish and brownish gray, slightly calcareous; slight show of OIL	2782 - 2787
18	Shale, greenish gray, in part sandy and micaceous	2787 - 2805
80	Shale, gray, with some interbedded greenish and brownish-gray slightly calcareous siltstone	2805 - 2885
25	Shale, gray, with a little interbedded greenish-gray siltstone	2885 - 2910

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
40	Siltstone, greenish gray, with some interbedded dark-gray shale	2910 - 2950
57	Shale, gray, containing minute spherical pyrite concretions, with some interbedded greenish-gray siltstone	2950 - 3007
18	Shale, gray	3007 - 3025
41	Shale, gray, with some interbedded greenish-gray slightly calcareous siltstone	3025 - 3066
16	Siltstone, greenish gray, with some interbedded dark-gray shale	3006 - 3082
8	Shale, dark gray, with some interbedded greenish-gray siltstone	3082 - 3090
16	Siltstone, greenish gray, with some interbedded dark-gray shale	3090 - 3106
24	Sandstone, very fine grained, brownish to dark brownish gray, somewhat calcareous	3106 - 3130
42	Shale, gray, sandy, with some interbedded gray to dark-gray shale	3130 - 3172
31	Shale, gray to dark gray, with some interbedded gray sandy shale	3172 - 3203
9	Shale, gray to very dark gray, almost black	3203 - 3212
35	Siltstone, gray, with some interbedded very dark-gray, almost black shale	3212 - 3247
	Bottom of Canadaway group	3247
16	Shale, greenish gray, sandy and somewhat calcareous	3247 - 3263
57	Shale, greenish gray, sandy, with some interbedded dark-gray shale	3263 - 3320
104	Shale, greenish gray, sandy	3320 - 3424
8	Shale, greenish gray, sandy, with a little interbedded very dark gray, almost black shale	3424 - 3432
32	Shale, greenish gray, sandy	3432 - 3464

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
41	Sandstone, very fine grained, light greenish gray, slightly calcareous containing an occasional shell fragment, with a little interbedded dark-gray shale	3464 - 3505
41	Sandstone, very fine grained, greenish gray, slightly calcareous, with a little interbedded gray shale	3505 - 3546
8	Sandstone, very fine grained, greenish gray, slightly calcareous, with considerable interbedded greenish-gray sandy shale	3546 - 3554
62	Shale, dark greenish gray, sandy, with some interbedded dark-gray shale	3554 - 3616
24	Shale, dark gray, in part sandy	3616 - 3640
12	Shale, gray to dark gray, with considerable interbedded very fine grained greenish-gray slightly calcareous sandstone	3640 - 3652
30	Shale, greenish gray, sandy, with some interbedded grayish-black sandy shale	3652 - 3682
12	Shale, grayish black, with some interbedded greenish-gray sandy shale	3682 - 3694
40	Shale, gray, with a little interbedded greenish-gray sandy shale and very fine grained sandstone	3694 - 3734
7	Shale, grayish black, with considerable interbedded greenish-gray sandy shale	3734 - 3741
33	Shale, dark gray	3741 - 3774
64	Shale, gray to greenish gray, sandy, with some interbedded dark-gray shale	3774 - 3838
29	Shale, dark gray, with a little interbedded gray sandy shale	3838 - 3867
20	Sandstone, very fine grained, dark grayish brown, with considerable interbedded gray sandy shale	3867 - 3887
33	Shale, dark greenish gray, sandy, with some interbedded dark-gray shale	3887 - 3920
32	Shale, dark greenish gray, sandy, with some interbedded grayish-black shale	3920 - 3952

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
84	Shale, dark gray, with a little interbedded gray sandy shale	3952 - 4036
40	Shale, dark gray, with some interbedded very fine grained dark grayish-brown sandstone	4036 - 4076
22	Shale, dark gray	4076 - 4098
16	Shale, dark gray, with a little interbedded greenish-gray siltstone	4098 - 4114
40	Shale, dark gray, in part sandy	4114 - 4154
22	Shale, dark gray, with a little interbedded grayish-black shale	4154 - 4176
55	Shale, grayish black, with some interbedded gray sandy shale	4176 - 4231
32	Shale, very dark gray, with some interbedded gray sandy shale	4231 - 4263
17	Shale, very dark gray to grayish black	4263 - 4280
40	Shale, very dark gray, with considerable interbedded gray sandy shale	4280 - 4320
24	Shale, grayish black, with a little interbedded gray somewhat calcareous shale	4320 - 4344
86	Shale, grayish black, with some interbedded dark-gray sandy shale	4344 - 4430
47	Shale, very dark gray	4430 - 4477
10	Shale, grayish black	4477 - 4487
97	Shale, very dark gray, slightly calcareous	4487 - 4584
32	Shale, grayish black, with a little interbedded dark-gray sandy shale	4584 - 4616
8	Shale, very dark gray	4616 - 4624
52	Shale, grayish black	4624 - 4676
33	Shale, grayish black, somewhat calcareous	4676 - 4709
32	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black shale	4709 - 4741

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
45	Shale, grayish black, somewhat calcareous	4741 - 4786
	Middle Devonian series, 406 feet	
	Tully limestone, 18 feet	
18	Limestone, very fine, dense, grayish to dark grayish brown, argillaceous	4786 - 4804
	Hamilton group, 326 feet	
24	Shale, dark brownish gray, calcareous, with some interbedded grayish-black calcareous shale	4804 - 4828
37	Shale, grayish black, with some interbedded dark brownish-gray somewhat calcareous shale	4828 - 4865
23	Shale, grayish black, somewhat calcareous, with some interbedded dark brownish-gray somewhat calcareous shale	4865 - 4888
8	Shale, very dark brownish gray, calcareous	4888 - 4896
8	Shale, very dark brownish gray, calcareous, with some interbedded grayish-black slightly calcareous shale	4896 - 4904
35	Shale, dark gray, somewhat calcareous	4904 - 4939
6	Shale, dark gray, somewhat calcareous, with some interbedded grayish-black slightly calcareous shale	4939 - 4945
25	Shale, dark gray, somewhat calcareous, with a little interbedded very fine, dense, dark grayish-brown argillaceous limestone	4945 - 4970
12	Limestone, very fine, dense, very dark brownish gray, argillaceous, with a great deal of interbedded very dark-gray calcareous shale	4970 - 4982
7	Shale, dark gray, calcareous	4982 - 4989
6	Limestone, very fine, dense, brownish gray, argillaceous	4989 - 4995
7	Limestone, very fine, dense, brownish gray, argillaceous, with considerable interbedded dark-gray calcareous shale	4995 - 5002

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, dark gray, calcareous	5002 - 5020
21	Shale, very dark gray, calcareous	5020 - 5041
34	Shale, grayish black, slightly calcareous; GAS pockets at 5057, 5067, 5070, and 5074	5041 - 5075
55	Shale, black; 7 small GAS pockets, 5075-5088	5075 - 5130
	Onondaga limestone, 62 feet	
26	Limestone, very fine, dense, light to dark brownish gray, argillaceous	5130 - 5156
17	Limestone, very fine, dense, light brownish gray, argillaceous, containing a little light brownish-gray dense chert	5156 - 5173
8	Limestone, very fine, dense, brownish gray, argillaceous, containing considerable brownish-gray dense chert	5173 - 5181
11	Limestone, very fine, dense, dark brownish gray, argillaceous, containing considerable brownish-gray dense chert and some glauconite	5181 - 5192
	Lower Devonian series, 57+ feet	
	Oriskany sandstone, 12 feet	
6	Sandstone, medium-grained, light gray, somewhat calcareous, quartzose, with many of grains subrounded and rounded	5192 - 5198
3	Sandstone, fine- to medium-grained, light gray, almost white, somewhat calcareous, quartzose, with many of grains subrounded and rounded	5198 - 5201
3	Limestone, very fine, dense, dark brownish gray, siliceous; show of DISTILLATE and SALT WATER	5201 - 5204
	Helderberg group, 145+ feet	
7	Limestone, very fine, dense, dark brownish gray, argillaceous	5204 - 5211
15	Limestone, very fine, dense, very dark brownish gray, almost black, argillaceous	5211 - 5226

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Limestone, very fine, dense, very dark brownish gray, argillaceous and sandy, with some interbedded very fine crystalline dark brownish-gray limestone	5226 - 5243
45	Limestone, very fine, dense, dark grayish brown, argillaceous, containing some shell fragments	5243 - 5288
9	Limestone, very fine, dense, light brownish gray, argillaceous and somewhat magnesian	5288 - 5297
52	Limestone, very fine, dense, dark to very dark grayish brown, argillaceous	5297 - 5349
	TOTAL DEPTH	5349

WELL-SAMPLE RECORD

NO.

22

WELL-SAMPLE RECORD

WELL NO. 3737, WARRANT 3788
UNITED NATURAL GAS COMPANY

Elk County, Pa., Highland Township, Warrant 3788
Kane Quadrangle: 1.02 miles north of 41° 35' N. Lat. and .15 mile east of 78° 50' W. Long.
Completed: 1928
Elevation: 1836 feet above sea level.
Total depth: 7930 feet.
Deepest formation: Queenston
Result: Show of gas at 1478 feet in Dewdrop sand, gas in Upper Kane sand, gas pockets between 5110 and 5180 feet in Hamilton, at 5402 in Helderberg, and at 5436 and 5476 feet in Cobleskill. Some black salt water at 5476 in Cobleskill. Oriskany sandstone absent. Dry in Albion. Completed as a small gas well in Upper Kane sand.
Samples: 0 to 7930 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 200+ feet	
	Pocono group, 200+ feet	
38	Sandstone, medium- to coarse-grained, contains rounded quartz pebbles up to 65 mm. in diameter	0 - 38
42	Sandstone, medium- to coarse-grained, light greenish-gray, contains discoidal quartz pebbles up to 127 mm. in diameter	38 - 80
10	Shale, greenish-gray, fossiliferous	80 - 90
	Knapp sandstone, 110 feet	
5	Sandstone, medium-grained, light-gray, with occasional quartz grains up to 2.5 mm. in diameter, calcareous	90 - 95
10	Shale, greenish-gray, fossiliferous	95 - 105
95	Sandstone, medium-grained, light-gray, with occasional quartz grains up to 2.5 mm. in diameter, sparingly fossiliferous and in part calcareous	105 - 200

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 5220 feet	
	Upper Devonian Series, 4672 feet	
	Conewango group, 497 feet	
	Oswayo formation, 170 feet	
30	Shale, greenish-gray	200 - 230
5	Shale, greenish-gray, sandy	230 - 235
55	Sandstone, fine-grained, light greenish-gray, sparingly fossiliferous and somewhat calcareous in lower part	235 - 290
10	Shale, greenish-gray, sandy, slightly calcareous	290 - 300
40	Sandstone, fine- to medium-grained, light greenish-gray, slightly calcareous, contains carbonized plant remains	300 - 340
15	Shale, greenish-gray to grayish-brown, sandy	340 - 355
15	Sandstone, fine-grained, light greenish-gray, in part calcareous	355 - 370
	Cattaraugus formation, 327 feet	
35	Sandstone, very fine grained, brick-red to reddish-brown, argillaceous	370 - 405
10	Shale, reddish-brown	405 - 415
10	Sandstone, very fine grained, reddish-brown, argillaceous	415 - 425
12	Shale, brick-red	425 - 437
37	Shale, reddish-brown, sandy	437 - 474
18	Shale, greenish-gray and sandy shale	474 - 492
24	Shale, brick-red to reddish-brown, sandy	492 - 516
18	Sandstone, very fine grained, reddish-brown, argillaceous	516 - 534
18	Shale, greenish-gray, sandy, contains carbonized plant stems	534 - 552

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine grained, reddish-brown, argillaceous	552 - 558
6	Shale, reddish-brown	558 - 564
30	Shale, greenish-gray, sandy	564 - 594
6	Shale, reddish-brown, sandy	594 - 600
12	Sandstone, very fine grained, dark grayish-brown to greenish-gray, somewhat calcareous	600 - 612
27	Sandstone, very fine grained, reddish-brown, argillaceous	612 - 639
14	Shale, greenish-gray	639 - 653
7	Sandstone, very fine grained, brick-red, argillaceous	653 - 660
11	Shale, reddish-brown	660 - 671
12	Shale, brick-red, sandy	671 - 683
6	Sandstone, very fine grained, brick-red, argillaceous	683 - 689
8	Shale, reddish-brown, sandy	689 - 697
	Conneaut group, 745 feet	
115	Shale, greenish-gray, sandy, fossiliferous	697 - 812
12	Sandstone, very fine grained, dark grayish-brown to greenish-gray, very fossiliferous	812 - 824
36	Shale, greenish-gray, sandy, fossiliferous	824 - 860
12	Shale, greenish-gray	860 - 872
72	Shale, greenish-gray, sandy, with some interbedded thin layers of very fine grained light greenish-gray sandstone, fossiliferous	872 - 944
54	Shale, greenish-gray, with some interbedded thin layers of very fine grained greenish-gray sandstone, fossiliferous	944 - 998
30	Shale, greenish-gray, sandy, with some interbedded very fine grained light greenish-gray sandstone, fossiliferous	998 - 1028

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
12	Shale, greenish-gray, with some interbedded very fine grained light brownish-gray sandstone, fossiliferous	1028 - 1040
6	Sandstone, very fine grained, light brownish- and greenish-gray, slightly calcareous	1040 - 1046
	Top of "pink rock"	1046
24	Shale, dark purplish-gray, sandy, with some interbedded greenish-gray sandy shale	1046 - 1070
6	Shale, greenish-gray	1070 - 1076
6	Shale, purplish-gray, sandy	1076 - 1082
48	Shale, purplish-gray, with a few interbedded thin layers of very fine grained greenish-gray sandstone, fossiliferous	1082 - 1130
6	Shale, greenish-gray, sandy	1130 - 1136
6	Shale, purplish-gray, sandy	1136 - 1142
	Bottom of "pink rock"	1142
18	Sandstone, fine-grained, light greenish-gray, fossiliferous and slightly calcareous	1142 - 1160
60	Shale, greenish-gray, sandy, with some interbedded thin layers of very fine grained light greenish-gray sandstone, slightly calcareous	1160 - 1220
24	Shale, greenish-gray	1220 - 1244
6	Sandstone, very fine grained, light greenish-gray, fossiliferous and somewhat calcareous	1244 - 1250
48	Shale, greenish-gray, with some interbedded thin layers of very fine grained light greenish-gray sandstone, which are somewhat fossiliferous and calcareous	1250 - 1298
24	Shale, greenish-gray, sandy	1298 - 1322
53	Shale, greenish-gray, with some interbedded thin layers of very fine grained light greenish-gray sandstone, which are fossiliferous and somewhat calcareous	1322 - 1375

Thickness Feet	Description of Strata	Depth in feet
10	Shale, greenish-gray, sandy, with some interbedded thin layers of very fine grained light greenish-gray sandstone, which are fossiliferous and somewhat calcareous	1375 - 1385
	Top of Bradford First sand	1385
5	Sandstone, fine-grained, light greenish-gray, somewhat calcareous	1385 - 1390
5	Shale, greenish-gray	1390 - 1395
5	Sandstone, fine-grained, light greenish-gray	1395 - 1400
6	Shale, greenish-gray	1400 - 1406
6	Sandstone, very fine grained, greenish-gray	1406 - 1412
24	Shale, greenish-gray	1412 - 1436
6	Sandstone, very fine grained, greenish-gray	1436 - 1442
	Bottom of Conneaut group	1442
41	Shale, greenish-gray, with some interbedded fine- to coarse-grained light-gray sandstone, show of GAS at 1478	1442 - 1483
10	Sandstone, fine-grained, light gray, with occasional quartz grains up to 3 mm. in diameter, Dewdrop sand	1483 - 1493
57	Shale, greenish-gray	1493 - 1550
20	Sandstone, fine-grained, light greenish-gray, Chipmunk sand	1550 - 1570
112	Shale, greenish-gray	1570 - 1682
68	Shale, greenish-gray, with some interbedded thin layers of fine-grained light greenish-gray sandstone, in part fossiliferous	1682 - 1750
5	Sandstone, fine-grained, light-gray	1750 - 1755
105	Shale, greenish-gray	1755 - 1860
88	Shale, greenish-gray, with some interbedded thin layers of fine-grained light greenish-gray sandstone and greenish-gray sandy shale, fossils	1860 - 1948

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
22	Shale, greenish-gray, with some interbedded thin layers of fine-grained grayish-brown sandstone, horizon of Bradford Third sand	1948 - 1970
36	Shale, greenish-gray	1970 - 2006
12	Shale, greenish-gray, sandy	2006 - 2018
52	Shale, greenish-gray, with some interbedded sandy shale	2018 - 2070
74	Shale, greenish-gray, with some interbedded thin layers of fine-grained grayish-brown sandstone, fossiliferous	2070 - 2144
10	Shale, gray, fossiliferous	2144 - 2154
5	Shale, greenish-gray, sandy	2154 - 2159
36	Sandstone, fine-grained, grayish-brown, fossiliferous, Upper Kane sand, GAS	2159 - 2195
60	Shale, greenish-gray, sandy, with some interbedded thin layers of fine-grained grayish-brown sandstone, sparingly fossiliferous	2195 - 2255
10	Sandstone, very fine grained, grayish-brown, with considerable interbedded greenish-gray sandy shale, Lower Kane sand	2255 - 2265
10	Shale, greenish-gray, sparingly fossiliferous	2265 - 2275
73	Shale, greenish-gray, sandy	2275 - 2348
34	Shale, greenish-gray	2348 - 2382
60	Shale, greenish-gray, sandy	2382 - 2442
43	Shale, greenish-gray to gray	2442 - 2485
12	Shale, dark-gray, sandy, fossiliferous	2485 - 2497
113	Shale, greenish-gray	2497 - 2610
32	Shale, greenish-gray, with some interbedded thin layers of very fine grained grayish-brown sandstone	2610 - 2642
134	Shale, gray and greenish-gray	2642 - 2776

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
219	Shale, gray and greenish-gray, with interbedded thin seams of grayish-black shale, and very fine grained light greenish-gray sandstone	2776 - 2995
10	Shale, greenish-gray, sandy	2995 - 3005
223	Shale, gray and greenish-gray, with some interbedded greenish-gray sandy shale and a few thin seams of grayish-black shale	3005 - 3228
40	Sandstone, very fine grained, light greenish-gray, slightly calcareous, contains fragments of plant remains in the upper part	3228 - 3268
25	Shale, greenish-gray, sandy	3268 - 3293
13	Sandstone, very fine grained, light greenish-gray,	3293 - 3306
6	Shale, greenish-gray, sandy	3306 - 3312
6	Sandstone, very fine grained, light greenish-gray	3312 - 3318
24	Shale, greenish-gray, sandy	3318 - 3342
18	Sandstone, very fine grained, light greenish-gray, slightly calcareous	3342 - 3360
18	Shale, greenish-gray	3360 - 3378
12	Sandstone, very fine grained, light greenish-gray, somewhat calcareous	3378 - 3390
90	Shale, gray and greenish-gray, with some interbedded thin layers of very fine grained light greenish-gray sandstone, slightly calcareous	3390 - 3480
152	Shale, gray and greenish-gray, with some interbedded greenish-gray sandy shale	3480 - 3632
24	Shale, greenish-gray, sandy	3632 - 3656
6	Sandstone, very fine grained, dark grayish-brown	3656 - 3662
256	Shale, gray and greenish-gray, with a little interbedded greenish-gray sandy shale and very fine grained light greenish-gray sandstone	3662 - 3918

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, very fine grained, dark grayish-brown	3918 - 3930
36	Shale, gray and greenish-gray	3930 - 3966
6	Sandstone, very fine grained, dark grayish-brown	3966 - 3972
23	Shale, gray to dark-gray	3972 - 3995
20	Sandstone, very fine grained, dark grayish-brown	3995 - 4015
45	Shale, gray to dark-gray	4015 - 4060
42	Shale, grayish-black	4060 - 4102
18	Shale, dark-gray	4102 - 4120
18	Shale, grayish-black	4120 - 4138
46	Shale, dark-gray, with some interbedded grayish-black shale	4138 - 4184
5	Shale, grayish-black	4184 - 4189
10	Shale, dark-gray	4189 - 4199
33	Shale, gray, with some interbedded very fine grained dark grayish-brown sandstone	4199 - 4232
12	Shale, brownish-gray	4232 - 4244
6	Shale, greenish-gray	4244 - 4250
12	Shale, grayish-to brownish-black	4250 - 4262
6	Shale, brownish-gray	4262 - 4268
6	Shale, greenish-gray	4268 - 4274
13	Shale, grayish-to brownish-black	4274 - 4287
13	Shale, dark-gray	4287 - 4300
12	Shale, grayish-black	4300 - 4312
30	Shale, gray	4312 - 4342
12	Shale, brownish-black	4342 - 4354
18	Shale, brownish-gray	4354 - 4372

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
6	Shale, grayish-black	4372 - 4378
6	Shale, dark-gray	4378 - 4384
6	Shale, grayish-black	4384 - 4390
48	Shale, dark-gray	4390 - 4438
6	Shale, grayish-black	4438 - 4444
34	Shale, very dark gray	4444 - 4478
6	Shale, grayish-black	4478 - 4484
12	Shale, greenish-gray	4484 - 4496
88	Shale, dark-gray	4496 - 4584
18	Shale, grayish-black	4584 - 4602
6	Shale, very dark gray	4602 - 4608
8	Shale, grayish-black	4608 - 4616
12	Shale, dark-gray	4616 - 4628
6	Shale, grayish-black	4628 - 4634
24	Shale, very dark gray	4634 - 4658
12	Shale, grayish-black	4658 - 4670
30	Shale, dark-gray	4670 - 4700
6	Shale, grayish-black	4700 - 4706
31	Shale, very dark gray	4706 - 4737
36	Shale, very dark gray, sandy	4737 - 4773
30	Shale, grayish-black, somewhat calcareous	4773 - 4803
6	Shale, very dark gray, sandy, calcareous	4803 - 4809
63	Shale, grayish-black, somewhat calcareous	4809 - 4872
	Middle Devonian Series, 478 feet	
	Tully limestone, 6 feet	
6	Limestone, very fine, crystalline, dark brownish-gray	4872 - 4878

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
	Hamilton group, 432 feet	
6	Shale, grayish-black, slightly calcareous	4878 - 4884
6	Shale, very dark gray, slightly calcareous	4884 - 4890
6	Shale, grayish-black, slightly calcareous	4890 - 4896
59	Shale, dark to very dark gray, slightly calcareous	4896 - 4955
6	Shale, grayish-black, calcareous	4955 - 4961
18	Shale, very dark gray, somewhat calcareous	4961 - 4979
11	Shale, gray, slightly calcareous	4979 - 4990
90	Shale, dark-gray, somewhat calcareous	4990 - 5080
24	Shale, very dark gray, slightly calcareous	5080 - 5104
12	Shale, grayish-black	5104 - 5116
36	Shale, very dark gray, somewhat calcareous	5116 - 5152
6	Shale, black, calcareous	5152 - 5158
9	Shale, grayish-black, somewhat calcareous	5158 - 5167
107	Shale, black, with a thin seam of dense light-gray limestone at 5208 feet	5167 - 5274
16	Shale, grayish-black, somewhat calcareous, containing minute disseminated pyrite crystals	5274 - 5290
3	Shale, brown, micaceous, bentonitic	5290 - 5293
13	Shale, very dark gray to grayish-black, somewhat calcareous, with considerable interbedded very fine, dense, light- to dark-gray argillaceous limestone	5293 - 5306
4	Shale, grayish-black, slightly calcareous	5306 - 5310
	Onondaga formation, 40 feet	
6	Limestone, very fine, crystalline, light-gray, somewhat silty and argillaceous, containing glauconite and fragments of shells	5310 - 5316

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
2	Limestone, very fine, crystalline, light-gray, somewhat silty and argillaceous, containing a little light-gray dense chert	5316 - 5318
7	Siltstone, light brownish-gray, calcareous and argillaceous, containing glauconite, and a little light-gray dense chert	5318 - 5325
9	Chert, gray, silty, slightly calcareous, containing considerable light-gray to dark brownish-gray dense chert	5325 - 5334
4	Chert, dense, light- to dark brownish-gray, with considerable interbedded gray, slightly calcareous, silty chert	5334 - 5338
2	Chert, dense, light- to dark brownish-gray, with considerable interbedded dark-gray slightly calcareous siltstone and silty shale containing abundant glauconite	5338 - 5340
9	Chert, light-gray, slightly calcareous, with considerable interbedded dark-gray silty and sandy shale containing abundant glauconite. Some of larger quartz grains in sandy shale are rounded and frosted	5340 - 5349
1	Sandstone, fine-grained, mottled gray, calcareous, containing fragments of shells	5349 - 5350
	Lower Devonian Series, 70 feet	
	Helderberg limestone, 70 feet	
20	Limestone, very fine, dense, dark gray, argillaceous, containing some very dark brownish-gray dense chert	5350 - 5370
5	Limestone, very fine, crystalline, brownish-gray, somewhat silty and argillaceous, slightly magnesian, containing a little light-gray dense chert	5370 - 5375
5	Limestone, very fine, dense, dark brownish-gray, somewhat silty and argillaceous, slightly magnesian, containing fragments of shells	5375 - 5380
15	Limestone, very fine, dense, very dark brownish gray, sandy and slightly magnesian, some of fine- to medium-sized angular quartz grains show secondary crystal facets	5380 - 5395

Thickness Feet	Description of Strata	Depth in feet
18	Limestone, very fine, dense, brownish-gray, silty and argillaceous, slightly magnesian	5395 - 5413
7	Limestone, very fine, dense, very dark brownish gray, somewhat silty and slightly magnesian	5413 - 5420
	SILURIAN SYSTEM, 1822 feet	
	Upper Silurian or Cayugan Series, 1276 feet	
	Cobleskill limestone, 60 feet	
10	Limestone, very fine, dense, light-gray to brownish-gray, argillaceous, and somewhat magnesian	5420 - 5430
25	Limestone, very fine, dense, light- to dark brownish-gray, finely laminated, argillaceous and somewhat magnesian, containing a little light-gray dense chert	5430 - 5455
15	Limestone, very fine, dense, dark brownish-gray, argillaceous and slightly magnesian, containing a little brownish-gray dense chert	5455 - 5470
10	Limestone, very fine, dense, dark brownish-gray, argillaceous and slightly silty, somewhat magnesian; a little SALT WATER at 5476 feet	5470 - 5480
	Salina group, 1216 feet	
6	Limestone, very fine, dense, dark brownish-gray, argillaceous and somewhat magnesian, containing some very fine, crystalline, light brownish-gray anhydrite	5480 - 5486
86	Limestone, very fine, dense, dark to very dark brownish-gray, argillaceous and slightly magnesian, with a great deal of interbedded very fine, crystalline, light brownish- to brownish-gray anhydrite and a little light greenish-gray, slightly calcareous shale	5486 - 5572
36	Limestone, very fine, dense, dark brownish-gray, shaly and slightly magnesian, with a great deal of interbedded very fine, crystalline, light brownish-gray anhydrite	5572 - 5608

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
30	Limestone, very fine, dense, grayish-brown, argillaceous and somewhat magnesian, with considerable interbedded dark brownish-gray shaly limestone and some very fine, crystalline, light brownish-gray anhydrite	5608 - 5638
6	Limestone, very fine, dense, brown to dark-brown, argillaceous and slightly magnesian, containing considerable anhydrite	5638 - 5644
24	Limestone, dark brownish-gray, shaly, somewhat magnesian, containing a little anhydrite	5644 - 5668
37	Limestone, dark brownish-gray, shaly, slightly magnesian, containing a little anhydrite, with considerable interbedded very fine, dense, brown to dark-brown limestone	5668 - 5705
5	Anhydrite, very fine, crystalline, brownish-gray, argillaceous and calcareous	5705 - 5710
24	Shale, very dark gray, dolomitic	5710 - 5734
12	Salt, coarse-crystalline	5734 - 5746
12	Shale, dark-gray, slightly calcareous	5746 - 5758
12	Salt, medium- to coarse-crystalline	5758 - 5770
5	Shale, dark-gray	5770 - 5775
13	Salt, medium-crystalline	5775 - 5788
6	Shale, dark-gray, slightly calcareous	5788 - 5794
7	Salt, medium-crystalline	5794 - 5801
48	Limestone, very fine, dense, light-gray, argillaceous	5801 - 5849
54	Limestone, very fine, dense, light-gray, argillaceous, interbedded with dark brownish-gray magnesian limestone	5849 - 5903
7	Salt, medium-crystalline	5903 - 5910
18	Limestone, very fine, dense, light to dark grayish-brown, argillaceous, magnesian	5910 - 5928
18	Limestone, very fine, dense, brown to dark grayish-brown, argillaceous	5928 - 5946

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
24	Limestone, very fine, dense, light to dark grayish-brown, argillaceous, magnesian	5946 - 5970
18	Limestone, very fine, dense, light to dark grayish-brown, argillaceous, with a little anhydrite	5970 - 5988
6	Limestone, very fine, dense, grayish-brown, argillaceous, magnesian	5988 - 5994
16	Salt, medium- to coarse-crystalline	5994 - 6010
5	Limestone, very fine, dense, grayish-brown, argillaceous	6010 - 6015
30	Salt, coarse-crystalline	6015 - 6045
5	Limestone, very fine, dense, grayish-brown, argillaceous	6045 - 6050
5	Salt, coarse-crystalline	6050 - 6055
5	Limestone, very fine, dense, grayish-brown, argillaceous	6055 - 6060
15	Shale, gray to dark-gray	6060 - 6075
10	Limestone, very fine, dense, grayish-brown, argillaceous	6075 - 6085
10	Shale, gray	6085 - 6095
5	Limestone, very fine, dense, dark brownish-gray, argillaceous	6095 - 6100
270	Shale, light-gray to gray and clay, somewhat calcareous	6100 - 6370
15	Limestone, very fine, dense, dark brownish-gray, argillaceous, magnesian	6370 - 6385
35	Clay, brownish-gray, somewhat calcareous	6385 - 6420
25	Limestone, very fine, dense, dark brownish-gray, argillaceous, magnesian	6420 - 6445
5	Salt, medium-crystalline	6445 - 6450
5	Limestone, very fine, dense, dark grayish-brown, argillaceous	6450 - 6455
5	Shale, dark brownish-gray, somewhat calcareous	6455 - 6480

Thickness Feet	Description of Strata	Depth in feet
5	Salt, medium-crystalline	6480 - 6485
5	Clay, light-gray	6485 - 6490
10	Shale, dark brownish-gray to brownish-black, slightly calcareous	6490 - 6500
30	Limestone, dark to very dark brownish-gray, shaly, somewhat magnesian, containing some anhydrite	6500 - 6530
45	Shale, greenish-gray, somewhat dolomitic	6530 - 6575
6	Shale, dark-gray, somewhat dolomitic	6575 - 6581
17	Limestone, very fine, dense, brownish to very dark brownish-gray, argillaceous, containing a little anhydrite	6581 - 6598
9	Limestone, dark to very dark gray, shaly, somewhat magnesian	6598 - 6607
6	Limestone, very fine, dense, dark brownish-gray, somewhat argillaceous, dolomitic	6607 - 6613
3	Shale, dark-gray, somewhat dolomitic	6613 - 6616
5	Limestone, very fine, crystalline, dark brownish-gray, somewhat argillaceous, dolomitic	6616 - 6621
51	Shale, gray to dark-gray, dolomitic, with a little interbedded very fine, dense, dark brownish-gray, argillaceous and somewhat magnesian limestone	6621 - 6672
14	Limestone, dark brownish-gray, shaly, dolomitic	6672 - 6686
10	Limestone, very fine, dense, dark to very dark brownish gray, somewhat argillaceous, silty and magnesian	6686 - 6696
	Middle Silurian or Niagaran Series, 380 feet	
	Lockport-Guelph dolomite, 207 feet	
89	Dolomite, very fine, crystalline to dense, very dark brownish gray	6696 - 6785
31	Limestone, very fine, crystalline to dense, dark brownish-gray, somewhat argillaceous, silty and dolomitic	6785 - 6816

Thickness Feet	Description of Strata	Depth in feet
9	Limestone, very fine, crystalline, dark brownish-gray, somewhat argillaceous, silty and dolomitic	6816 - 6825
10	Limestone, very fine, crystalline, dark brownish-gray, sandy and somewhat dolomitic	6825 - 6835
24	Limestone, very fine, crystalline to dense, dark brownish-gray, silty and somewhat dolomitic	6835 - 6859
18	Limestone, very fine, dark brownish-gray, shaly and somewhat dolomitic	6859 - 6877
6	Limestone, very fine, crystalline, dark brownish-gray, argillaceous, silty and somewhat dolomitic	6877 - 6883
20	Limestone, very fine, dense to crystalline, dark brownish-gray, argillaceous and silty, somewhat dolomitic	6883 - 6903
	Clinton group, 173 feet	
12	Shale, dark-gray, somewhat dolomitic, with some interbedded very fine, crystalline, dark-gray silty dolomitic limestone	6903 - 6915
49	Shale, dark-gray, with some interbedded very fine, crystalline, dark-gray silty dolomitic limestone	6915 - 6964
4	Shale, dark-gray, slightly dolomitic, with a great deal of interbedded very fine, crystalline, light-gray somewhat argillaceous and dolomitic limestone	6964 - 6968
10	Shale, greenish-gray	6968 - 6978
14	Shale, grayish-purple, with some interbedded greenish-gray shale	6978 - 6992
29	Shale, greenish-gray, with some interbedded grayish-purple shale	6992 - 7021
25	Shale, grayish-green, with a few interbedded thin layers of very fine, crystalline, light-gray limestone	7021 - 7046
24	Shale, grayish-purple, with some interbedded greenish-gray shale	7046 - 7070

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, crystalline, gray, magnesian	7070 - 7074
2	Shale, greenish-gray	7074 - 7076
	Lower Silurian or Albion Series, 166 feet	
	Grimsby member, 70 feet	
4	Shale, reddish-brown, sandy	7076 - 7080
15	Sandstone, very fine grained, reddish-brown	7080 - 7095
12	Sandstone, very fine grained, red and pink	7095 - 7107
1	Shale, dark brownish-red	7107 - 7108
5	Sandstone, very fine grained, red and pink	7108 - 7113
7	Shale, reddish-brown, sandy	7113 - 7120
6	Sandstone, very fine grained, light-pink and gray	7120 - 7126
10	Shale, reddish-brown and greenish-gray, interbedded, sandy	7126 - 7136
7	Sandstone, very fine grained, light-pink and greenish-gray	7136 - 7143
3	Shale, reddish-brown, sandy	7143 - 7146
	Cabot Head and Manitoulin members, 29 feet	
5	Sandstone, very fine grained, light greenish-gray	7146 - 7151
2	Shale, dark greenish-gray, sandy	7151 - 7153
8	Sandstone, very fine grained, light-gray	7153 - 7161
1	Shale, dark-gray	7161 - 7162
1	Sandstone, very fine grained, light greenish-gray	7162 - 7163
4	Shale, greenish-gray, sandy	7163 - 7167
1	Sandstone, very fine grained, light greenish-gray	7167 - 7168
2	Shale, greenish-gray	7168 - 7170

No. 3737, Wt. 3788

Thickness Feet	Description of Strata	Depth in feet
4	Shale, very fine grained, light greenish-gray	7170 - 7174
1	Shale, greenish-gray	7174 - 7175
	Whirlpool sandstone, 67 feet	
67	Sandstone, very fine grained, light-gray	7175 - 7242
	ORDOVICIAN SYSTEM, 688+ feet	
	Upper Ordovician or Cincinnatian Series, 688+ feet	
	Queenston shale, 688+ feet	
303	Shale, reddish-brown, sandy	7242 - 7545
277	Shale, reddish-brown, sandy, somewhat calcareous	7545 - 7822
108	Shale, reddish-brown, sandy	7822 - 7930
	TOTAL DEPTH	7930

WELL-SAMPLE RECORD

NO.

23

WELL-SAMPLE RECORD

A. PARDEE ESTATE NO. 1 WELL
GODFREY L. CABOT, INC.

Cameron County, Pa., Gibson Township, Warrant 5947
Driftwood quadrangle: 1.08 miles south of 41° 25' N. Lat. and .08 mile east of 78° 15' W. Long.
Completed: January 29, 1951
Elevation: 1616 feet above sea level.
Total depth: 6794 feet
Deepest formation: Oriskany
Result: Small amount of water at 85 feet, more water at 143 feet and 333 feet, gas pocket at 6480 feet in Hamilton, 20 M C F gas at 6752 in Oriskany. Reservoir pressure of 2200 p.s.i. measured after well was shut in 26 days. Sand shot and acidized without appreciably increasing flow of gas.
Samples: 0 to 3187 feet and 4475 to 6794 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 391+ feet	
	Pocono group, 391+feet	
55	Sandstone, medium-grained, light-gray, stained light yellowish brown by weathering	0 - 55
	Top of Patton shale member	55
35	Siltstone, light grayish green, in part somewhat calcareous, containing a little muscovite, with some interbedded brick-red shale, small amount of water at 85 feet	55 - 90
9	Shale, grayish-green, with some interbedded light greenish gray slightly calcareous siltstone	90 - 99
11	Shale, brick-red, in part silty, with some interbedded grayish-green slightly calcareous siltstone	99 - 110
15	Shale, greenish-gray, in part silty, with some interbedded light greenish gray, somewhat calcareous silty shale containing brown sideritic concretions and a very little brick-red shale	110 - 125

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
	Bottom of Patton shale member	125
18	Shale, grayish-green, silty, containing some muscovite	125 - 143
19	Sandstone, fine- to medium-grained, light-gray, almost white, containing a little muscovite, with a little interbedded greenish-gray shale, some water at 143 feet	143 - 162
19	Sandstone, fine- to medium-grained, light greenish gray, containing occasional sub-rounded quartz pebbles up to 4 millimeters in diameter and minute brown siderite pellets, with a little interbedded greenish-gray shale	162 - 181
20	Sandstone, fine-grained, light greenish gray, containing a little muscovite, with a little interbedded light greenish gray shale	181 - 201
6	Shale, gray, silty	201 - 207
15	Sandstone, very fine grained, light greenish gray, containing a little muscovite, with a little interbedded gray silty shale	207 - 222
20	Sandstone, very fine grained, light greenish gray, containing a little muscovite	222 - 242
10	Shale, dark grayish green, silty, with considerable interbedded dark brick red slightly calcareous shale	242 - 252
7	Shale, dark grayish green, silty and sandy, containing some muscovite	252 - 259
7	Sandstone, very fine grained, light grayish green, containing a little muscovite	259 - 266
14	Shale, dark greenish gray, silty and sandy, with a little interbedded dark gray shale	266 - 280
20	Sandstone, very fine grained, greenish-gray, containing some muscovite, with some interbedded dark greenish gray silty shale	280 - 300
38	Sandstone, very fine grained, light greenish gray, containing a little muscovite and some minute fragments of carbonized plant remains, some water at 333 feet	300 - 338

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Sandstone, fine-grained, light greenish gray, calcareous, containing a little muscovite and occasional rounded quartz grains to .65 millimeter in diameter	338 - 348
6	Sandstone, very fine to fine-grained, light greenish gray, slightly calcareous, containing a little muscovite	348 - 354
12	Sandstone, very fine to fine-grained, light greenish gray, containing a little muscovite and some brown siderite concretions, with a little interbedded greenish-gray shale	354 - 366
7	Shale, greenish-gray, sandy and somewhat calcareous, containing a little muscovite and a few minute fragments of carbonized plant remains	366 - 373
7	Siltstone, greenish-gray, containing a little muscovite	373 - 380
11	Sandstone, very fine grained, light greenish gray, slightly calcareous, containing a little muscovite	380 - 391
	DEVONIAN SYSTEM, 6403+ feet	
	Upper Devonian Series, 5712 feet	
	Oswayo formation, 244 feet	
18	Shale, dark brick red, silty and in part slightly calcareous, with considerable interbedded greenish-gray slightly calcareous silty shale	391 - 409
6	Siltstone, greenish-gray, slightly calcareous	409 - 415
7	Siltstone, greenish-gray, with some interbedded greenish-gray shale	415 - 422
7	Sandstone, very fine grained, light greenish gray, slightly calcareous, containing a little muscovite	422 - 429
14	Shale, greenish-gray, silty, with some interbedded dark-gray silty shale containing occasional fragments of shells	429 - 443
14	Shale, brick-red, in part silty, with some interbedded greenish-gray silty shale	443 - 457

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, very fine grained, light greenish gray, slightly calcareous, containing a little muscovite, with a little interbedded brick-red shale and a little greenish-gray silty shale	457 - 469
10	Sandstone, very fine grained, containing a little muscovite, with a little interbedded greenish-gray silty shale	469 - 479
4	Siltstone, light greenish gray, calcareous	479 - 483
14	Shale, greenish-gray, silty, with considerable interbedded brick-red shale	483 - 497
33	Shale, greenish-gray, silty and slightly calcareous	497 - 530
13	Shale, greenish-gray, sandy and somewhat calcareous, with a little interbedded dark-gray shale	530 - 543
30	Shale, greenish-gray, sandy and somewhat calcareous	543 - 573
7	Shale, greenish-gray, silty, calcareous, containing abundant fragments of shells - Marvin Creek limestone of Ashburner (?)	573 - 580
13	Shale, greenish-gray, silty, somewhat calcareous and containing some brown siderite concretions	580 - 593
7	Sandstone, very fine grained, light greenish gray, calcareous, containing a little muscovite, with a little interbedded greenish-gray shale	593 - 600
10	Siltstone, light greenish gray, slightly calcareous, with considerable interbedded dark-gray shale	600 - 610
4	Sandstone, very fine grained, light greenish gray, slightly calcareous	610 - 614
21	Shale, greenish-gray, with some interbedded greenish-gray calcareous siltstone containing some brown siderite concretions	614 - 635

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
	Catskill red beds, 563 feet	
31	Shale, brick-red, with a little interbedded greenish-gray slightly calcareous shale	635 - 666
13	Shale, greenish-gray, in part silty	666 - 679
14	Shale, greenish-gray, with some interbedded, very fine grained greenish-gray sandstone	679 - 693
17	Shale, greenish-gray, with considerable interbedded, very fine grained, greenish-gray sandstone containing some muscovite and a few minute fragments of carbonized plant remains	693 - 710
61	Shale, brick-red, in part silty, with a little interbedded greenish-gray silty shale	710 - 771
25	Shale, brick-red, with considerable interbedded dark greenish gray sandy shale containing some muscovite	771 - 796
24	Shale, brick-red, silty, with a little interbedded greenish-gray silty shale	796 - 820
54	Shale, brick-red, in part silty	820 - 874
57	Shale, brick-red, in part silty and slightly calcareous	874 - 931
32	Sandstone, very fine grained, greenish-gray, containing some muscovite	931 - 963
36	Shale, brick-red, in part silty, with some interbedded grayish-green silty shale	963 - 1019
6	Sandstone, very fine grained, dark reddish brown, argillaceous	1019 - 1025
8	Shale, brick-red, in part silty, with considerable interbedded greenish-gray sandy shale	1025 - 1033
47	Sandstone, very fine grained, greenish-gray, containing a little muscovite and occasional minute fragments of carbonized plant remains in lower part, with some interbedded dark grayish red silty shale	1033 - 1080
5	Shale, greenish-gray, sandy, containing some muscovite, with some interbedded dark grayish red sandy shale	1080 - 1085

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, very fine grained, light greenish gray, with considerable interbedded brick-red silty shale and a little dark-gray shale	1085 - 1097
7	Shale, greenish-gray, sandy, with considerable interbedded brick-red silty shale	1097 - 1104
16	Shale, dark greenish gray, sandy	1104 - 1120
11	Shale, dark-gray, with a little interbedded very fine grained greenish-gray sandstone	1120 - 1131
26	Shale, dark greenish gray, silty	1131 - 1157
21	Shale, brick-red, silty and in part slightly calcareous, with considerable interbedded very fine to fine-grained greenish-gray argillaceous sandstone	1157 - 1178
20	Shale, grayish-red, sandy, containing considerable muscovite	1178 - 1198
	Bottom of Catskill red beds	1198
69	Sandstone, very fine to fine-grained, light greenish to greenish-gray, in part slightly calcareous and containing some muscovite	1198 - 1267
15	Sandstone, very fine to fine-grained, light greenish gray, containing occasional rounded quartz grains to 1.5 millimeters in diameter and a few minute fragments of carbonized plant remains in lower part	1267 - 1282
27	Shale, gray, with some interbedded, light greenish gray siltstone	1282 - 1309
37	Sandstone, very fine grained, light greenish gray, containing some muscovite, with a great deal of interbedded gray shale	1309 - 1346
19	Sandstone, very fine grained, light greenish to greenish gray, containing some muscovite and occasional rounded quartz grains to 1.5 millimeters in diameter, with a little interbedded gray shale	1346 - 1365
28	Sandstone, fine-grained, light greenish gray, very slightly calcareous and containing some muscovite	1365 - 1393

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
57	Shale, gray to dark-gray, in part silty	1393 - 1450
35	Shale, dark purplish gray, in part silty, with a little interbedded, greenish-gray siltstone containing occasional rounded quartz grains to 1.5 millimeters in diameter	1450 - 1485
10	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	1485 - 1495
1	Sandstone, fine-grained, brick-red, ferruginous, quartz grains coated with hematite, containing occasional quartz grains up to 1.5 millimeters in diameter	1495 - 1496
32	Siltstone, greenish-gray, with considerable interbedded greenish-gray shale	1496 - 1528
32	Sandstone, fine-grained, greenish-gray, slightly calcareous, containing occasional quartz grains up to 1.5 millimeters in diameter, with a little interbedded greenish-gray shale	1528 - 1560
10	Shale, gray, with considerable interbedded, very fine grained light greenish gray sandstone	1560 - 1570
12	Sandstone, very fine grained, light greenish gray, with considerable interbedded gray shale	1570 - 1582
6	Shale, gray, with some interbedded medium-grained light-gray sandstone	1582 - 1588
63	Shale, greenish-gray, with some interbedded light greenish gray siltstone and very fine grained sandstone	1588 - 1651
8	Shale, gray, with considerable interbedded very fine grained light brownish and light greenish gray sandstone	1651 - 1659
37	Shale, gray, with considerable interbedded greenish-gray siltstone	1659 - 1696
60	Shale, gray, with some interbedded greenish-gray siltstone containing some muscovite	1696 - 1756
22	Siltstone, greenish-gray, containing a little muscovite, with some interbedded gray shale	1756 - 1778

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
34	Sandstone, very fine grained, light greenish to greenish gray, containing a little muscovite and occasional minute fragments of carbonized plant remains in lower part, with considerable interbedded gray shale	1778 - 1812
6	Shale, gray to dark-gray, with considerable interbedded greenish-gray slightly calcareous siltstone containing occasional fragments of shells	1812 - 1818
6	Sandstone, very fine to fine-grained, light greenish to greenish gray, slightly calcareous, with some interbedded gray shale	1818 - 1824
27	Shale, gray, with some interbedded light greenish gray siltstone containing occasional fragments of shells	1824 - 1851
16	Shale, gray to dark-gray, with considerable interbedded light greenish gray siltstone containing occasional fragments of shells	1851 - 1867
10	Shale, gray with some interbedded very fine to fine-grained light greenish gray sandstone containing some fragments of shells	1867 - 1877
67	Shale, gray to dark-gray, with a little interbedded very fine grained greenish-gray sandstone containing a little muscovite	1877 - 1944
21	Shale, gray, with a little interbedded light greenish gray siltstone	1944 - 1965
51	Shale, gray, with a great deal of interbedded greenish-gray siltstone	1965 - 2016
40	Sandstone, very fine grained, light brownish gray, slightly calcareous, containing occasional minute fragments of carbonized plant remains in upper part	2016 - 2056
35	Shale, dark-gray, with considerable interbedded very fine grained, light greenish gray somewhat calcareous sandstone	2056 - 2091
54	Shale, gray, with some interbedded light greenish gray somewhat calcareous siltstone containing occasional fragments of shells	2091 - 2145
10	Sandstone, very fine grained, light greenish gray, slightly calcareous, with some interbedded gray shale	2145 - 2155

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
73	Shale, greenish-gray, with a little interbedded light greenish gray somewhat calcareous siltstone containing abundant fragments of shells	2155 - 2228
21	Shale, dark greenish gray	2228 - 2249
16	Shale, dark greenish gray, with a little interbedded greenish-gray siltstone	2249 - 2265
32	Shale, dark greenish gray, with a little interbedded light greenish gray siltstone containing occasional fragments of shells	2265 - 2297
12	Shale, dark-gray, with a great deal of interbedded very fine grained light greenish gray sandstone	2297 - 2309
28	Sandstone, very fine grained, containing a little muscovite and occasional minute fragments of carbonized plant remains in part replaced by pyrite, with considerable interbedded dark-gray shale	2309 - 2337
42	Sandstone, very fine grained, light greenish gray, slightly calcareous, with some interbedded gray shale	2337 - 2379
41	Shale, gray, with considerable interbedded very fine grained light greenish gray somewhat calcareous sandstone containing a little muscovite	2379 - 2420
8	Sandstone, very fine grained, light greenish gray, somewhat calcareous, containing occasional shell fragments, with a great deal of interbedded gray shale	2420 - 2428
55	Shale, dark greenish gray	2428 - 2483
25	Shale, dark greenish gray, with some interbedded dark-gray slightly calcareous siltstone	2483 - 2508
27	Siltstone, dark greenish gray, slightly calcareous, with considerable interbedded dark greenish gray shale	2508 - 2535
44	Shale, greenish-gray	2535 - 2579
56	Siltstone, greenish-gray, containing some muscovite, with considerable interbedded dark greenish gray shale	2579 - 2635

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
26	Siltstone, greenish-gray, containing a little muscovite and biotite, with some interbedded dark-gray shale	2635 - 2661
58	Shale, dark-gray to dark greenish gray, silty, containing fragments of shells	2661 - 2719
25	Shale, dark-gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing occasional fragments of shells	2719 - 2744
15	Shale, greenish-gray, silty and somewhat calcareous, containing fragments of shells	2744 - 2759
36	Shale, dark-gray, with some interbedded greenish-gray silty shale containing fragments of shells	2759 - 2795
40	Shale, dark greenish gray	2795 - 2835
23	Shale, gray	2835 - 2858
56	Shale, gray, with a little interbedded greenish-gray siltstone	2858 - 2914
54	Shale, gray, with some interbedded greenish-gray silty shale	2914 - 2968
30	Shale, gray, with a little interbedded greenish-gray to dark-gray siltstone	2968 - 2998
32	Siltstone, greenish-gray, with considerable interbedded gray shale	2998 - 3030
17	Shale, gray, with considerable interbedded greenish-gray siltstone	3030 - 3047
10	Shale, greenish-gray, silty and slightly calcareous	3047 - 3057
41	Siltstone, greenish-gray to dark-gray, slightly calcareous, containing an occasional shell fragment, with a little interbedded gray shale	3057 - 3098
16	Siltstone, dark brownish gray, slightly calcareous, containing occasional fragments of shells, with considerable interbedded dark greenish gray silty shale	3098 - 3114
19	Shale, dark brownish and greenish gray, silty, slightly calcareous, containing some muscovite and fragments of shells	3114 - 3133

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Shale, greenish-gray, silty, containing an occasional shell fragments, with some interbedded gray shale	3133 - 3163
24	Siltstone, greenish-gray, with considerable interbedded gray to dark-gray shale	3163 - 3187
1288	No samples	3187 - 4475
26	Shale, dark to very dark gray, in part silty, with some interbedded gray siltstone	4475 - 4501
15	Shale, dark-gray, with some interbedded grayish-black shale	4501 - 4516
20	Shale, gray to dark-gray, in part silty, with some interbedded dark to very dark gray shale and a little very dark gray silty shale	4516 - 4536
9	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	4536 - 4545
60	Shale, greenish-gray to dark-gray, silty, with some interbedded dark-gray shale	4545 - 4605
37	Shale, dark to very dark gray, with some interbedded greenish-gray to dark-gray silty shale	4605 - 4642
25	Shale, greenish-gray, silty, with a great deal of interbedded dark-gray shale	4642 - 4667
26	Shale, dark to very dark gray, with some interbedded gray silty shale	4667 - 4693
40	Shale, gray to greenish-gray, silty, with considerable interbedded dark-gray shale	4693 - 4733
85	Shale, gray to dark-gray, with some interbedded gray silty shale	4733 - 4818
12	Shale, gray to greenish-gray, with considerable interbedded gray to dark-gray shale	4818 - 4830
19	Shale, gray to dark-gray, with a little interbedded gray to greenish-gray silty shale	4830 - 4849
18	Shale, gray to greenish-gray, silty, with a great deal of interbedded gray to dark-gray shale	4849 - 4867
24	Shale, gray to dark-gray, with considerable interbedded gray to greenish-gray silty shale	4867 - 4891

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Shale, dark to very dark gray, with a great deal of interbedded gray to greenish-gray silty shale	4891 - 4907
33	Shale, gray to greenish-gray, silty, with considerable interbedded dark-gray shale	4907 - 4940
37	Shale, dark-gray, with some interbedded gray silty shale and a little very dark gray to grayish-black shale	4940 - 4977
39	Shale, gray to dark-gray, silty, with considerable interbedded dark-gray shale and a little very dark gray to grayish-black shale	4977 - 5016
80	Shale, dark-gray, with a little interbedded gray to dark-gray silty shale and a little very dark gray to grayish-black shale	5016 - 5096
24	Shale, dark-gray	5096 - 5120
76	Shale, dark-gray, with a little interbedded gray to dark-gray silty shale	5120 - 5196
83	Shale, dark-gray, with a little interbedded very dark gray to grayish-black shale and a little gray to greenish-gray silty shale	5196 - 5279
55	Shale, dark-gray, with considerable interbedded gray to dark-gray silty shale	5279 - 5334
81	Shale, dark to very dark gray, silty, with some interbedded dark-gray shale	5334 - 5415
30	Shale, dark-gray	5415 - 5445
36	Shale, greenish-gray to dark-gray, silty, with some interbedded dark to very dark gray shale	5445 - 5481
58	Shale, dark to very dark gray, with a little interbedded greenish-gray to dark gray shale	5481 - 5539
40	Shale, very dark gray to grayish-black	5539 - 5579
31	Shale, very dark gray to grayish-black, with a little interbedded gray to dark-gray silty shale	5579 - 5610
44	Shale, dark to very dark gray	5610 - 5654

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
24	Shale, dark to very dark gray, with a little interbedded greenish-gray to dark-gray silty shale	5654 - 5678
29	Shale, very dark gray to grayish-black, with considerable interbedded gray to dark-gray silty shale	5678 - 5707
56	Shale, dark-gray, in part silty	5707 - 5763
100	Shale, dark to very dark gray, in part silty and slightly clacareous	5763 - 5863
34	Shale, dark to very dark gray, silty, somewhat calcareous, with a little interbedded grayish-black shale	5863 - 5897
63	Shale, very dark gray to grayish-black, somewhat calcareous	5897 - 5960
27	Shale, very dark gray, slightly calcareous	5960 - 5987
27	Shale, dark to very dark gray, in part silty, somewhat calcareous	5987 - 6014
44	Shale, dark-gray, in part silty, somewhat calcareous	6014 - 6058
37	Shale, dark to very dark gray, in part silty, somewhat calcareous	6058 - 6095
8	Shale, very dark gray to grayish-black, somewhat calcareous	6095 - 6103
	Middle Devonian Series, 648 feet	
	Hamilton group, 616 feet	
	Top of Tully limestone	6103
9	Limestone, very fine, clastic, light-gray to gray, argillaceous, containing micro fossils, with a great deal of interbedded dark-gray to grayish-black somewhat calcareous shale	6103 - 6112
11	Shale, dark-gray, calcareous, with some interbedded grayish-black slightly calcareous shale and some very fine, clastic, light-gray argillaceous limestone	6112 - 6123

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
40	Shale, dark-gray, somewhat calcareous with some interbedded very fine, clastic, gray, argillaceous limestone containing microfossils and a little grayish-black shale	6123 - 6163
3	Shale, dark-gray, calcareous, with a little interbedded very fine, clastic, gray to dark-gray argillaceous limestone	6163 - 6166
23	Limestone, very fine, clastic, dark-gray, argillaceous, containing an occasional shell fragment, with a little interbedded very dark gray to grayish-black somewhat calcareous shale	6166 - 6189
	Bottom of Tully limestone	6189
80	Shale, very dark gray, somewhat calcareous	6189 - 6269
10	Shale, dark to very dark gray, slightly calcareous, with a little interbedded grayish-black shale	6269 - 6279
82	Shale, dark to very dark gray	6279 - 6361
117	Shale, very dark gray somewhat calcareous	6361 - 6478
171	Shale, very dark gray to grayish-black, somewhat calcareous, GAS pocket at 6480 feet	6478 - 6649
69	Shale, grayish-black, somewhat calcareous, containing a little finely disseminated pyrite	6649 - 6718
1	Bentonite, grayish-brown, micaceous, Tioga	6718 - 6719
	Onondaga formation, 32 feet	
15	Limestone, fine to medium, clastic, gray to dark-gray, argillaceous, containing minute fragments of shells, with some interbedded grayish-black somewhat calcareous shale	6719 - 6734
3	Shale, dark-gray, calcareous	6734 - 6737
3	Shale, dark to very dark gray, calcareous, containing glauconite and a little very dark gray semichalcedonic chert	6737 - 6740
1	Limestone, fine, clastic, dark gray, argillaceous containing microfossils and considerable dark to very dark gray semichalcedonic chert	6740 - 6741

A. Pardee Estate No. 1

Thickness Feet	Description of Strata	Depth in feet
2	Shale, dark to very dark gray, calcareous, containing a little glauconite	6741 - 6743
8	Shale, dark to very dark gray, somewhat calcareous, with a great deal of interbedded gray to dark-gray semichalcedonic chert	6743 - 6751
	Lower Devonian Series, 43+ feet	
	Oriskany group, 43+ feet	
	Ridgeley sandstone, 43+ feet	
14	Sandstone, medium- to coarse-grained, quartzose, light-gray, slightly calcareous, some of larger quartz grains rounded and frosted, some possess secondary crystal faces, very little porosity, 20 M C F GAS at 6752 feet	6751 - 6765
10	Sandstone, medium-grained, light-gray, quartzose, slightly calcareous, some of quartz grains possess secondary crystal faces, very little porosity	6765 - 6775
2	Sandstone, medium- to coarse-grained, light-gray, quartzose, somewhat calcareous	6775 - 6777
6	Sandstone, fine- to medium-grained, light brownish gray, quartzose, somewhat calcareous, some of larger quartz grains rounded and frosted	6777 - 6783
11	Limestone, fine, clastic, light- to dark-gray, very sandy, most of fine quartz grains angular to subangular, many possess secondary crystal faces, a few of larger ones are rounded and frosted	6783 - 6794
	TOTAL DEPTH	6794

WELL-SAMPLE RECORD

NO.

24

WELL-SAMPLE RECORD

ARTHUR E. MATTESON NO. 1 WELL
POTTER DEVELOPMENT COMPANY

Potter County, Pa., Hebron Township
Coudersport Quadrangle: .75 mile south of 41° 50' N. Lat. and .11 mile west of 78° 05' W. Long.
Completed: August 26, 1932.
Elevation: 2180 feet above sea level.
Total depth: 5561 feet.
Deepest formation: Salina.
Result: No sandstone at Oriskany horizon; shot interval from 5160-5190 feet with 200 quarts nitro-glycerine without results.
Samples: 630 to 5550 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 5245+ feet	
	Upper Devonian Series, 4567+ feet	
630	No samples collected	0 - 630
2	Shale, greenish gray, sandy	630 - 632
	Top of Bradford First sand	632
27	Sandstone, very fine-grained, light greenish gray, slightly calcareous	632 - 659
16	Shale, greenish gray	659 - 675
23	Sandstone, very fine-grained, greenish gray, slightly calcareous	675 - 698
	Bottom of Bradford First sand	698
10	Shale, dark greenish gray, sandy	698 - 708
22	Shale, gray	708 - 730
6	Sandstone, fine-grained, light greenish gray, slightly calcareous	730 - 736
94	Shale, gray, with a little interbedded dark greenish-gray fossiliferous sandy shale	736 - 830

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine-grained, light gray, somewhat calcareous and very fossiliferous	830 - 836
12	Shale, gray, fossiliferous	836 - 848
7	Sandstone, very fine-grained, light brownish gray, somewhat calcareous and fossiliferous	848 - 855
8	Shale, greenish gray	855 - 863
29	Sandstone, fine-grained, light brownish gray, somewhat calcareous and fossiliferous	863 - 892
29	Shale, greenish gray	892 - 921
39	Shale, greenish gray, sandy, somewhat calcareous, and very fossiliferous	921 - 960
135	Shale, gray to dark gray, with a little interbedded fine-grained light greenish-gray fossiliferous sandstone	960 - 1095
15	Shale, greenish gray, sandy, fossiliferous	1095 - 1110
2	Sandstone, fine-grained, dark grayish brown, somewhat calcareous and fossiliferous	1110 - 1112
24	Shale, greenish gray	1112 - 1136
18	Sandstone, fine-grained, light grayish brown, slightly calcareous and fossiliferous with some interbedded greenish-gray shale	1136 - 1154
88	Shale, greenish gray, in part fossiliferous	1154 - 1242
48	Shale, dark gray	1242 - 1290
24	Sandstone, fine-grained, chocolate brown, with considerable interbedded greenish gray shale; Crandall Hill or Bradford Third sand	1290 - 1314
16	Shale, greenish gray, with some interbedded fine-grained chocolate-brown sandstone	1314 - 1330
176	Shale, greenish gray	1330 - 1506

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
19	Sandstone, very fine-grained, light grayish brown, with some interbedded greenish-gray shale	1506 - 1525
9	Shale, gray	1525 - 1534
6	Sandstone, very fine-grained, chocolate brown, slightly calcareous	1534 - 1540
8	Shale, greenish gray	1540 - 1548
8	Shale, dark gray. sandy	1548 - 1556
6	Sandstone, very fine-grained, dark chocolate brown	1556 - 1562
54	Shale, dark gray, sandy, with a little interbedded gray shale	1562 - 1616
74	Shale, dark gray, with some interbedded greenish-gray sandy shale	1616 - 1690
8	Sandstone, very fine-grained, grayish brown	1690 - 1698
114	Shale, greenish gray, sandy	1698 - 1812
78	Shale, dark gray, sandy	1812 - 1890
66	Shale, dark gray	1890 - 1956
6	Shale, grayish black	1956 - 1962
11	Shale, very dark gray	1962 - 1973
122	Shale, dark greenish gray, sandy	1973 - 2095
6	Sandstone, very fine-grained, light gray, slightly calcareous	2095 - 2101
7	Shale, dark grayish brown, sandy	2101 - 2108
32	Shale, dark gray, sandy	2108 - 2140
22	Shale, dark gray	2140 - 2162
7	Shale, dark grayish brown, sandy	2162 - 2169
31	Shale, dark gray	2169 - 2200
22	Shale, very dark gray	2200 - 2222

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, grayish black	2222 - 2232
8	Sandstone, very fine-grained, grayish brown	2232 - 2240
7	Shale, very dark gray	2240 - 2247
4	Shale, grayish brown, sandy	2247 - 2251
19	Shale, greenish gray, sandy	2251 - 2270
10	Shale, brownish gray, sandy	2270 - 2280
70	Shale, dark greenish gray, sandy	2280 - 2350
29	Shale, very dark grayish brown, sandy	2350 - 2379
10	Shale, gray	2379 - 2389
19	Sandstone, very fine-grained, dark grayish brown	2389 - 2408
10	Shale, dark grayish brown, sandy	2408 - 2418
28	Sandstone, very fine-grained, dark grayish brown, slightly calcareous	2418 - 2446
64	Shale, dark greenish gray, sandy	2446 - 2510
18	Sandstone, very fine-grained, dark grayish brown	2510 - 2528
17	Shale, greenish gray, sandy	2528 - 2545
8	Sandstone, very fine-grained, greenish gray, slightly calcareous	2545 - 2553
51	Shale, dark greenish gray, sandy	2553 - 2604
2	Shale, grayish black	2604 - 2606
8	Shale, very dark grayish brown, sandy, containing plant fragments	2606 - 2614
51	Shale, gray to dark gray, sandy	2614 - 2665
10	Shale, grayish black	2665 - 2675
33	Shale, dark gray	2675 - 2708
10	Shale, very dark gray	2708 - 2718

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish gray, sandy	2718 - 2736
16	Shale, dark grayish brown, sandy	2736 - 2752
22	Shale, dark gray, sandy	2752 - 2774
10	Sandstone, very fine-grained, very dark brownish gray	2774 - 2784
206	Shale, dark gray, sandy	2784 - 2990
17	Shale, dark grayish brown, sandy	2990 - 3007
48	Shale, dark gray, with some interbedded greenish-gray sandy shale	3007 - 3055
6	Sandstone, very fine-grained, greenish gray	3055 - 3061
20	Sandstone, very fine-grained, dark brownish gray	3061 - 3081
10	Shale, greenish gray to dark gray	3081 - 3091
8	Sandstone, very fine-grained, very dark brownish gray	3091 - 3099
40	Shale, gray to dark gray	3099 - 3139
43	Shale, dark gray, sandy, with some interbedded dark gray shale	3139 - 3182
7	Sandstone, very fine-grained, dark greenish gray, and grayish brown, slightly calcareous	3182 - 3189
76	Shale, dark gray, sandy	3189 - 3265
80	Shale, dark gray	3265 - 3345
18	Shale, dark gray, sandy	3345 - 3363
35	Shale, dark gray	3363 - 3398
10	Shale, grayish black	3398 - 3408
93	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	3408 - 3501
12	Shale, dark gray	3501 - 3513
5	Sandstone, very fine-grained, dark greenish and brownish-gray	3513 - 3518

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, dark gray	3518 - 3528
18	Sandstone, very fine-grained, very dark greenish gray, with some interbedded very dark gray shale	3528 - 3546
19	Sandstone, very fine-grained, dark greenish and brownish gray	3546 - 3565
56	Shale, dark to very dark gray	3565 - 3621
19	Sandstone, very fine-grained, dark greenish gray, with some interbedded dark gray shale	3621 - 3640
178	Shale, dark to very dark gray	3640 - 3818
27	Shale, grayish black	3818 - 3845
180	Shale, dark to very dark gray	3845 - 4025
9	Shale, grayish black	4025 - 4034
11	Shale, dark gray	4034 - 4045
50	Shale, grayish black, with some interbedded dark gray shale	4045 - 4095
8	Shale, very dark gray	4095 - 4103
22	Shale, black	4103 - 4125
95	Shale, grayish black, with some interbedded dark gray shale	4125 - 4220
55	Shale, very dark gray	4220 - 4275
70	Shale, very dark gray, slightly calcareous	4275 - 4345
22	Shale, grayish black, slightly calcareous	4345 - 4367
1	Limestone, very fine, dense, very dark brownish gray, fossiliferous; Genundewa	4367 - 4368
42	Shale, grayish black, somewhat calcareous	4368 - 4410
25	Shale, grayish black, slightly calcareous	4410 - 4435
71	Shale, grayish black	4435 - 4506

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
61	Shale, grayish black, slightly calcareous	4506 - 4567
	Middle Devonian Series, 607 feet	
	Tully limestone, 48 feet	
18	Limestone, very fine, dense, dark brownish gray, argillaceous, with some interbedded grayish-black calcareous shale	4567 - 4585
30	Limestone, very fine, dense, dark brownish gray, argillaceous	4585 - 4615
	Hamilton group, 532 feet	
10	Shale, very dark gray. somewhat calcareous	4615 - 4625
25	Shale, grayish black, slightly calcareous	4625 - 4650
6	Shale, very dark gray	4650 - 4656
20	Shale, grayish black	4656 - 4676
9	Shale, grayish black, somewhat calcareous	4676 - 4685
10	Shale, very dark gray, somewhat calcareous	4685 - 4695
10	Shale, very dark gray	4695 - 4705
30	Shale, grayish black, slightly calcareous	4705 - 4735
34	Shale, very dark gray, somewhat calcareous	4735 - 4769
41	Shale, very dark gray, slightly calcareous	4769 - 4810
7	Shale, grayish black, slightly calcareous	4810 - 4817
13	Shale, very dark gray	4817 - 4830
5	Shale, grayish black	4830 - 4835
25	Shale, very dark gray, slightly calcareous	4835 - 4860
10	Shale, grayish black, slightly calcareous	4860 - 4870
75	Shale, very dark gray, slightly calcareous	4870 - 4945
20	Shale, grayish black, somewhat calcareous	4945 - 4965
19	Shale, very dark gray, slightly calcareous	4965 - 4984
8	Shale, very dark gray, calcareous	4984 - 4992

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, grayish black, calcareous	4992 - 5000
35	Shale, very dark gray, calcareous	5000 - 5035
18	Shale, grayish black, calcareous	5035 - 5053
48	Shale, black, somewhat calcareous	5053 - 5101
46	Shale, black, slightly calcareous	5101 - 5147
	Onondaga limestone, 27 feet	
12	Limestone, very fine, crystalline, light to dark gray	5147 - 5159
15	Limestone, very fine, dense, brownish gray, cherty	5159 - 5174
	Lower Devonian Series, 71 feet	
	Oriskany formation, 5 feet	
5	Limestone, very fine, crystalline, dark brownish gray, cherty, with occasional well-rounded fine to medium-sized quartz grains	5174 - 5179
	Helderberg group, 66 feet	
66	Limestone, very fine, crystalline, very dark brownish gray, siliceous	5179 - 5245
	SILURIAN SYSTEM, 316+ feet	
	Upper Silurian or Cayugan Series, 316+ feet	
	Cobleskill limestone, 5 feet	
5	Limestone, very fine, dense, very dark gray	5245 - 5250
	Salina group, 311+ feet	
	Bertie member, 62 feet	
24	Limestone, very fine, dense, gray, argillaceous and siliceous, dolomitic	5250 - 5274
38	Limestone, very fine, dense, very dark brownish gray, argillaceous and siliceous, dolomitic	5274 - 5312
	Bottom of Bertie member	5312

Matteson No. 1

Thickness Feet	Description of Strata	Depth in feet
88	Limestone, very fine, dense, very dark brownish gray, argillaceous, dolomitic, containing some anhydrite	5312 - 5400
7	Shale, gray, calcareous, containing a little anhydrite	5400 - 5407
35	Limestone, very fine, dense, dark brownish gray, argillaceous, dolomitic	5407 - 5442
5	Shale, dark gray, somewhat calcareous	5442 - 5447
81	Limestone, very fine, dense, dark brownish gray, argillaceous, dolomitic, containing some anhydrite	5447 - 5528
5	Salt, medium-grained, crystalline, light gray	5528 - 5533
7	Limestone, very fine, dense, dark brownish gray, argillaceous, dolomitic	5533 - 5540
21	Salt, medium-grained, crystalline, light gray	5540 - 5561
	TOTAL DEPTH	5561

WELL-SAMPLE RECORD

NO.

25

WELL-SAMPLE RECORD

STATE OF PENNSYLVANIA NO. 2 WELL
GODFREY L. CABOT, INC.

Potter County, Pa., Wharton Township, Warrant 4734
Short Run Quadrangle: .78 mile north of 41° 30' N. Lat., and 1.40 miles east of 78° 00' W. Long.
Completed: March 30, 1948.
Elevation: 2120 feet above sea level.
Total depth: 6,314 feet
Deepest formation: Oriskany
Result: 7,400,000 cubic feet of gas per day, initial open flow, 3500 pounds per square inch reservoir pressure, at 6303.5-6314 feet in Oriskany sandstone.
Samples: 0 to 3523 and 4796 to 6307 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 6314+ feet	
	Upper Devonian Series, 4830+ feet	
	Catskill facies, 669 feet	
27	Shale, dark reddish gray, silty	0 - 27
7	Sandstone, very fine-grained, light grayish green, argillaceous, slightly weathered, containing a little muscovite and a few minute fragments of carbonized plant remains, with a very little interbedded red silty shale	27 - 34
16	Sandstone, very fine to fine-grained, light greenish gray, argillaceous, slightly calcareous, in part stained by weathering	34 - 50
15	Sandstone, very fine-grained, light greenish gray, argillaceous, containing some biotite and muscovite, slightly calcareous	50 - 65
22	Shale, brick red, slightly calcareous	65 - 87
14	Sandstone, very fine-grained, light greenish gray, argillaceous and containing some muscovite	87 - 101

Thickness Feet	Description of Strata	Depth in feet
3	Sandstone, very fine-grained, dark reddish gray, argillaceous	101 - 104
11	Shale, brick red, in part silty, with a little interbedded very fine-grained, greenish-gray, argillaceous sandstone	104 - 115
12	Sandstone, very fine-grained, light greenish gray, argillaceous, containing some muscovite, with some interbedded brick-red silty shale	115 - 127
21	Shale, dark grayish red, silty	127 - 148
19	Shale, brick red	148 - 167
16	Sandstone, very fine-grained, light grayish green to dark gray, argillaceous, containing a little muscovite	167 - 183
7	Shale, brick red, silty, with a very little interbedded, very fine-grained, grayish-green sandstone containing an occasional shell fragment	183 - 190
32	Shale, brick red, silty, containing some muscovite	190 - 222
5	Shale, greenish gray, sandy, containing some muscovite	222 - 227
37	Sandstone, very fine-grained, light greenish gray, argillaceous, containing minute fragments of carbonized plant remains	227 - 264
19	Sandstone, very fine to fine-grained, light grayish green, calcareous, containing occasional fragments of shells and ferro-calcite concretions; small amount of WATER at 270 feet	264 - 283
39	Shale, brick red, in part silty, with a very little interbedded grayish-green siltstone	283 - 322
12	Sandstone, fine-grained, grayish red, argillaceous, with considerable interbedded, very fine-grained, light grayish-green sandstone	322 - 334
13	Sandstone, very fine-grained, light greenish gray, slightly calcareous, with a little interbedded gray silty shale	334 - 347

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
19	Sandstone, very fine-grained, greenish-gray, containing some muscovite, with a little interbedded gray silty shale	347 - 366
21	Sandstone, fine-grained, light greenish gray, very slightly calcareous, containing a little muscovite and a few minute fragments of carbonized plant remains with associated pyrite	366 - 387
13	Sandstone, fine-grained, light greenish gray, very slightly calcareous, with some interbedded greenish-gray silty shale	387 - 400
11	Sandstone, fine to medium-grained, light greenish gray, calcareous, containing a little muscovite	400 - 411
33	Shale, dark purplish red, in part silty, with a little interbedded, light greenish gray, somewhat calcareous siltstone	411 - 444
15	Shale, brick red, with a great deal of interbedded, dark grayish-red sandy shale	444 - 459
24	Sandstone, very fine-grained, grayish red, argillaceous, containing a little muscovite	459 - 483
6	Sandstone, very fine-grained, very light grayish red, slightly calcareous, containing a little muscovite	483 - 489
9	Sandstone, very fine-grained, greenish and reddish gray, argillaceous and slightly calcareous, containing some muscovite	489 - 498
16	Sandstone, very fine-grained, very light gray, containing some muscovite	498 - 514
19	Sandstone, very fine-grained, dark greenish and reddish gray, containing some muscovite; 8-inch casing set at 520 feet	514 - 533
20	Sandstone, very fine-grained, light gray, with some interbedded, greenish to dark greenish-gray silty shale	533 - 553
21	Shale, dark grayish red, sandy, containing some muscovite	553 - 574

Thickness Feet	Description of Strata	Depth in feet
9	Shale, dark grayish red, sandy, with considerable interbedded grayish-green sandy shale	574 - 583
15	Sandstone, very fine-grained, light gray, somewhat calcareous, with considerable interbedded dark grayish-red sandy shale	583 - 598
25	Shale, variegated, greenish and reddish gray, sandy, containing some biotite and muscovite	598 - 623
6	Sandstone, very fine-grained, variegated greenish and reddish gray, containing some muscovite	623 - 629
25	Shale, grayish red, sandy, containing some muscovite	629 - 654
6	Sandstone, very fine-grained, variegated greenish and reddish gray, containing some muscovite	654 - 660
9	Shale, grayish red, sandy	660 - 669
	Bottom of Catskill facies	669
16	Sandstone, very fine-grained, light reddish gray, with some interbedded grayish-red sandy shale	669 - 685
26	Shale, grayish green, silty	685 - 711
26	Sandstone, very fine-grained, variegated greenish and reddish gray, containing a little muscovite, with a little interbedded grayish-green shale	711 - 737
42	Shale, greenish gray, with considerable interbedded, very fine-grained, greenish gray, slightly calcareous sandstone containing a little muscovite and occasional minute fragments of carbonized plant remains	737 - 779
16	Shale, dark gray, with a little interbedded, very fine-grained, light gray sandstone	779 - 795
18	Sandstone, very fine-grained, light greenish gray, with a little interbedded greenish-gray shale	795 - 813
32	Shale, greenish to dark greenish gray, in part silty	813 - 845

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
28	Shale, dark greenish gray, in part silty, with some interbedded dark purplish-red shale	845 - 873
5	Siltstone, greenish gray, slightly calcareous, with some interbedded dark greenish-gray shale	873 - 878
26	Shale, greenish gray, in part silty	878 - 904
9	Siltstone, light greenish gray, with considerable interbedded greenish-gray shale	904 - 913
19	Sandstone, very fine-grained, light greenish gray, slightly calcareous, with considerable interbedded dark gray shale	913 - 932
18	Shale, dark greenish gray, silty, with some interbedded grayish-red shale and a little very fine-grained light gray sandstone	932 - 950
10	Shale, grayish red, silty, with considerable interbedded greenish to dark greenish-gray siltstone	950 - 960
5	Shale, dark gray, with considerable interbedded greenish-gray silty shale and a little grayish-red silty shale	960 - 965
14	Sandstone, very fine-grained, light greenish gray, slightly calcareous, with some interbedded greenish-gray shale	965 - 979
31	Shale, greenish gray, in part silty	979 - 1010
28	Shale, gray, with some interbedded greenish-gray siltstone	1010 - 1038
27	Shale, dark gray, with a little interbedded light greenish-gray siltstone	1038 - 1065
31	Shale, very dark gray, sandy, containing some muscovite, a little pyrite and abundant minute fragments of carbonized plant remains	1065 - 1096
42	Shale, greenish gray, in part silty, with some interbedded, greenish-gray siltstone containing fragments of shells	1096 - 1138
18	Shale, dark purplish gray, in part silty and sandy, with a little interbedded greenish-gray, silty shale	1138 - 1156

Thickness Feet	Description of Strata	Depth in feet
28	Shale, dark greenish gray, in part silty	1156 - 1184
56	Shale, greenish gray to dark gray, with considerable interbedded greenish gray, slightly calcareous siltstone containing fragments of shells	1184 - 1240
10	Shale, dark greenish gray, silty, with considerable interbedded, greenish gray, somewhat calcareous siltstone containing fragments of shells and some dark grayish-red silty shale	1240 - 1250
10	Shale, dark gray, in part silty, with considerable interbedded, greenish gray, somewhat calcareous siltstone and a little dark grayish-red silty shale	1250 - 1260
26	Shale, dark greenish gray, with a little interbedded, greenish-gray siltstone containing fragments of shells	1260 - 1286
10	Shale, greenish gray	1286 - 1296
20	Shale, greenish gray, with a little interbedded, very fine-grained, light gray sandstone containing fragments of shells and a very little red oolitic hematite	1296 - 1316
63	Shale, gray, with some interbedded, very fine-grained, somewhat calcareous sandstone containing occasional fragments of shells	1316 - 1379
19	Shale, dark gray, with a little interbedded very fine-grained, light gray, somewhat calcareous sandstone	1379 - 1398
18	Shale, dark gray, with considerable interbedded, dark brownish gray, calcareous siltstone and very fine-grained sandstone containing fragments of shells	1398 - 1416
9	Siltstone, dark greenish gray, somewhat calcareous, containing occasional fragments of shells, with some interbedded dark gray shale	1416 - 1425
10	Shale, gray, with considerable interbedded, very fine-grained, light gray, somewhat calcareous sandstone containing occasional fragments of shells	1425 - 1435

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish gray, with considerable interbedded greenish-gray, somewhat calcareous siltstone containing fragments of shells	1435 - 1453
27	Siltstone, mottled brownish and greenish gray, slightly calcareous, with considerable interbedded dark gray shale	1453 - 1480
26	Shale, dark gray, with considerable interbedded, light greenish to brownish gray, slightly calcareous siltstone containing some fragments of shells	1480 - 1506
8	Shale, greenish gray, silty, containing fragments of shells, with a great deal of interbedded brownish-gray, slightly calcareous siltstone	1506 - 1514
30	Shale, gray, with a great deal of interbedded dark gray shale and a little brownish and greenish-gray siltstone containing occasional fragments of shells	1514 - 1544
20	Shale, dark gray, with some interbedded greenish-gray siltstone containing fragments of shells	1544 - 1564
16	Sandstone, very fine-grained, light gray, somewhat calcareous, containing occasional fragments of shells, with some interbedded greenish-gray shale	1564 - 1580
169	Shale, gray to dark gray, with a little interbedded gray siltstone containing fragments of shells	1580 - 1749
16	Shale, dark greenish and purplish gray, silty, with considerable interbedded dark gray shale and a little greenish-gray, slightly calcareous siltstone	1749 - 1765
16	Shale, dark greenish and purplish gray, with some interbedded gray shale and some greenish-gray, somewhat calcareous siltstone	1765 - 1781
18	Shale, gray to dark gray, with some interbedded dark greenish and purplish-gray silty shale	1781 - 1799
41	Shale, gray to dark gray	1799 - 1840

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
143	Shale, greenish gray, silty, somewhat calcareous, containing fragments of shells, with some interbedded gray shale	1840 - 1983
10	Siltstone, dark brownish and greenish gray, somewhat calcareous, containing fragments of shells, with some interbedded gray shale	1983 - 1993
36	Shale, gray, with some interbedded greenish-gray silty shale, containing fragments of shells	1993 - 2029
7	Sandstone, very fine-grained, light gray to light brownish gray, somewhat calcareous, containing occasional fragments of shells, with some interbedded dark gray silty shale	2029 - 2036
45	Shale, gray to dark gray, with a little interbedded, very fine-grained, light gray to light brownish-gray, somewhat calcareous sandstone, containing an occasional shell fragment	2036 - 2081
79	Shale, dark gray, with a little interbedded gray siltstone containing some muscovite and an occasional shell fragment	2081 - 2160
38	Shale, dark gray, with some interbedded brownish and greenish-gray, somewhat calcareous siltstone	2160 - 2198
18	Shale, dark gray, with some interbedded very dark gray shale and some brownish and greenish-gray, somewhat calcareous siltstone	2198 - 2216
22	Shale, dark gray, in part silty, containing fragments of shells	2216 - 2238
23	Shale, greenish gray, silty and somewhat calcareous, with a little interbedded dark gray shale	2238 - 2261
41	Shale, greenish gray, silty and somewhat calcareous, containing fragments of shells, with some interbedded gray shale	2261 - 2302
30	Shale, greenish gray, silty and slightly calcareous, containing occasional fragments of shells, with considerable interbedded gray shale	2302 - 2332

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
26	Shale, dark gray, with considerable interbedded greenish-gray, somewhat calcareous, silty shale containing fragments of shells	2332 - 2358
24	Shale, gray, in part silty, with a little interbedded greenish-gray, slightly calcareous siltstone	2358 - 2382
7	Siltstone, greenish gray, somewhat calcareous, with considerable interbedded dark gray shale	2382 - 2389
23	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, containing fragments of shells, with some interbedded dark gray shale	2389 - 2412
9	Shale, gray to dark gray, with some interbedded gray silty shale, containing fragments of shells	2412 - 2421
15	Shale, greenish gray, silty and slightly calcareous, containing fragments of shells and some muscovite, with some interbedded dark gray shale	2421 - 2436
44	Siltstone, greenish gray, somewhat calcareous, containing fragments of shells, with a little interbedded gray to dark gray silty shale	2436 - 2480
6	Shale, greenish gray, silty, with a little interbedded gray shale	2480 - 2486
31	Siltstone, light greenish gray, slightly calcareous, with some interbedded gray shale	2486 - 2517
29	Shale, gray, in part silty, with some interbedded light greenish-gray, slightly calcareous siltstone containing fragments of shells	2517 - 2546
15	Shale, dark gray, with considerable interbedded greenish gray, slightly calcareous, silty shale and a little very dark gray silty shale	2546 - 2561
50	Shale, greenish gray, silty and slightly calcareous, containing fragments of shells, with some interbedded gray to dark gray shale	2561 - 2611

Thickness Feet	Description of Strata	Depth in feet
34	Shale, dark gray, with some interbedded greenish-gray silty and slightly calcareous shale	2611 - 2645
45	Shale, greenish gray, silty, and slightly calcareous, containing occasional fragments of shells, with some interbedded gray to dark gray shale	2645 - 2690
7	Siltstone, gray, slightly calcareous, with considerable interbedded gray shale	2690 - 2697
26	Shale, greenish gray, silty and calcareous containing fragments of shells, with some interbedded light greenish-gray, calcareous siltstone	2697 - 2723
12	Siltstone, greenish gray, slightly calcareous, with some interbedded gray shale	2723 - 2735
30	Siltstone, light gray, somewhat calcareous, with some interbedded gray shale	2735 - 2765
12	Shale, dark gray, with considerable interbedded gray, silty shale	2765 - 2777
67	Shale, gray, silty, containing fragments of shells	2777 - 2844
24	Shale, gray, silty, and slightly calcareous, with some interbedded dark gray shale	2844 - 2868
7	Shale, greenish gray	2868 - 2875
37	Shale, dark gray, with some interbedded light gray to gray siltstone containing fragments of shells	2875 - 2912
6	Siltstone, greenish and dark brownish gray, containing occasional fragments of shells, with some interbedded dark gray shale	2912 - 2918
26	Shale, dark gray, in part silty, with some interbedded greenish-gray siltstone containing fragments of shells	2918 - 2944
56	Shale, greenish gray to dark gray, silty, containing occasional fragments of shells	2944 - 3000
39	Shale, greenish gray, silty and slightly calcareous, with considerable interbedded gray to dark gray shale	3000 - 3039

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
30	Shale, dark gray, with some interbedded greenish-gray silty shale containing occasional fragments of shells	3039 - 3069
39	Shale, gray to dark gray, with some interbedded light greenish-gray siltstone	3069 - 3108
32	Shale, dark gray, with a little interbedded light greenish-gray siltstone	3108 - 3140
91	Shale, gray to dark gray, with some interbedded greenish-gray silty shale containing an occasional shell fragment	3140 - 3231
39	Shale, mottled greenish gray and dark gray, silty, with considerable interbedded dark gray shale	3231 - 3270
49	Shale, dark gray, with a little interbedded greenish-gray silty shale containing an occasional shell fragment	3270 - 3319
17	Shale, greenish gray, silty, containing an occasional shell fragment with some interbedded dark gray shale	3319 - 3336
36	Shale, dark gray, with considerable interbedded greenish-gray silty shale	3336 - 3372
62	Shale, dark gray, with a little interbedded gray silty shale containing an occasional shell fragment	3372 - 3434
50	Shale, dark gray, with some interbedded light gray siltstone containing occasional shell fragments	3434 - 3484
15	Shale, dark gray, with considerable interbedded gray silty shale	3484 - 3495
22	Shale, dark gray, with a little interbedded gray silty shale	3495 - 3517
6	Shale, dark gray, with a little interbedded very dark gray shale	3517 - 3523
1273	No samples	3523 - 4796
291	Shale, dark to very dark gray, in part silty, in part minutely laminated and containing a few minute spherical pyrite concretions	4796 - 5087

Thickness Feet	Description of Strata	Depth in feet
8	Shale, very dark gray, in part silty, with some interbedded grayish-black shale	5087 - 5095
11	Shale, very dark gray, in part silty	5095 - 5106
30	Shale, very dark gray, in part silty, with a little interbedded grayish-black shale	5106 - 5136
47	Shale, very dark gray, with some interbedded grayish-black shale	5136 - 5183
37	Shale, very dark gray, slightly calcareous	5183 - 5220
149	Shale, very dark gray, almost black, slightly calcareous, intersected by occasional calcite veinlets	5220 - 5369
85	Shale, grayish black, slightly calcareous	5369 - 5454
42	Shale, very dark gray, almost black, silty and slightly calcareous	5454 - 5496
24	Shale, grayish black, slightly calcareous	5496 - 5520
6	Shale, black, somewhat calcareous	5520 - 5526
19	Shale, black, slightly calcareous	5526 - 5545
21	Shale, black, calcareous	5545 - 5566
	Middle Devonian Series, 736 feet	
	Tully limestone, 88 feet	
5	Limestone, very fine, dense, light gray, argillaceous	5566 - 5571
8	Shale, very dark gray, very calcareous	5571 - 5579
50	Limestone, very fine, dense, gray to dark gray, argillaceous	5579 - 5629
5	Shale, dark to very dark gray, somewhat calcareous	5629 - 5634
14	Limestone, very fine, dense, dark brownish gray, argillaceous	5634 - 5648
6	Limestone, very fine, dense, dark gray, argillaceous	5648 - 5654

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
	Hamilton group, 629 feet	
33	Shale, very dark gray, calcareous	5654 - 5687
21	Shale, dark gray, calcareous, with a little interbedded, grayish-black shale	5687 - 5708
11	Shale, very dark gray, somewhat calcareous	5708 - 5719
38	Shale, very dark gray, somewhat calcareous, with a little interbedded grayish-black shale	5719 - 5757
23	Shale, very dark gray, somewhat calcareous, with some interbedded grayish-black shale	5757 - 5780
15	Shale, dark to very dark gray, slightly calcareous	5780 - 5795
13	Shale, very dark gray to grayish black, slightly calcareous	5795 - 5808
130	Shale, very dark gray, slightly calcareous, containing an occasional shell fragment and intersected by minute calcite veinlets	5808 - 5938
29	Shale, very dark gray to grayish black, slightly calcareous, containing an occasional shell fragment (brachiopod)	5938 - 5967
33	Shale, very dark gray	5967 - 6000
74	Shale, very dark gray, slightly calcareous	6000 - 6074
14	Shale, very dark gray, somewhat calcareous	6074 - 6088
45	Shale, very dark gray to grayish black, somewhat calcareous	6088 - 6133
31	Shale, very dark gray, somewhat calcareous	6133 - 6164
26	Shale, grayish black, slightly calcareous	6164 - 6190
85	Shale, grayish black, somewhat clacareous, containing some minutely disseminated pyrite and intersected by calcite veinlets	6190 - 6275
8	Shale, grayish black, somewhat calcareous, with a little interbedded brown bentonite containing abundant minutely disseminated pyrite	6275 - 6283

State of Pennsylvania No. 2

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 19 feet	
3	Limestone, very fine, dark gray, somewhat argillaceous, containing fragments of shells, with some interbedded very dark gray calcareous shale	6283 - 6286
15	Limestone, very fine, light gray to gray, somewhat argillaceous, containing fragments of shells, with a little interbedded grayish-black calcareous shale	6286 - 6301
1	Shale, very dark gray to grayish black, slightly calcareous	6301 - 6302
	Lower Devonian Series, 12+ feet	
	Oriskany sandstone, 12+ feet	
3	Sandstone, medium to coarse-grained, light gray, quartzose and somewhat calcareous, with larger grains subrounded to rounded and frosted	6302 - 6305
2	Sandstone, coarse-grained, light gray, quartzose and somewhat calcareous, with larger grains subrounded to rounded	6305 - 6307
7	No samples; 7,400,000 cubic feet of GAS per day, initial open flow; 3500 pounds per square inch reservoir pressure, 6303.5-6314	6307 - 6314
	TOTAL DEPTH	6314

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

IDA WHEELER NO. 1 WELL
LYCOMING NATURAL GAS CORPORATION

Tioga County, Pa., Delmar Township
Hoytville Quadrangle: 2.81 miles south of 41° 45' N. Lat. and .03 mile west of 77° 20' W. Long.
Completed: May 31, 1932.
Elevation: 1836 feet above sea level
Total depth: 5663 feet
Result: Dry in Oriskany, no salt water.
Samples: 100 to 5663 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 5663+ feet	
	Upper Devonian Series, 4516+ feet	
100	No samples	0 - 100
239	Shale, greenish gray, sandy, fossiliferous and somewhat calcareous, with a little interbedded greenish-gray shale and fine-grained chocolate-brown sandstone	100 - 339
8	Sandstone, very fine-grained, greenish gray	339 - 347
30	Shale, greenish gray, sandy	347 - 377
13	Sandstone, very fine-grained, greenish gray, slightly calcareous	377 - 390
29	Shale, greenish gray, sandy	390 - 419
40	Sandstone, very fine-grained, greenish gray, fossiliferous and somewhat calcareous	419 - 459
35	Shale, greenish gray, sandy, sparingly fossiliferous and somewhat calcareous	459 - 494
6	Sandstone, very fine-grained, gray, somewhat calcareous	494 - 500

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, gray	500 - 506
20	Sandstone, very fine-grained, gray, sparingly fossiliferous and calcareous	506 - 526
6	Shale, gray	526 - 532
6	Sandstone, very fine-grained, gray	532 - 538
6	Shale, gray	538 - 544
33	Sandstone, very fine-grained, greenish gray, slightly calcareous	544 - 577
34	Shale, dark gray, fossiliferous and in part calcareous	577 - 611
21	Shale, dark gray	611 - 632
12	Shale, dark greenish gray, sandy, fossiliferous and somewhat calcareous	632 - 644
6	Sandstone, very fine-grained, gray, somewhat calcareous	644 - 650
71	Shale, dark gray, sandy, interbedded with gray shale, sparingly fossiliferous	650 - 721
42	Sandstone, very fine grained, light greenish gray, sparingly fossiliferous and in part calcareous	721 - 763
5	Shale, dark greenish gray, sandy	763 - 768
32	Sandstone, very fine grained, light greenish gray, calcareous in upper part	768 - 800
41	Shale, dark gray, interbedded with dark greenish gray sandy shale	800 - 841
21	Sandstone, very fine-grained, very dark brownish gray	841 - 862
329	Shale, greenish gray to dark greenish gray, sandy, sparingly fossiliferous	862 - 1191
32	Sandstone, very fine-grained, light gray, fossiliferous and somewhat calcareous	1191 - 1223
71	Shale, gray to dark gray, sandy, sparingly fossiliferous	1223 - 1294

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
69	Sandstone, very fine-grained, gray	1294 - 1363
21	Shale, dark gray	1363 - 1384
7	Sandstone, very fine-grained, gray	1384 - 1391
30	Shale, dark gray, sandy, fossiliferous	1391 - 1421
46	Shale, dark gray	1421 - 1467
31	Shale, dark greenish gray, sandy	1467 - 1498
7	Sandstone, very fine-grained, light gray, slightly calcareous	1498 - 1505
47	Shale, dark greenish gray, sandy, sparingly fossiliferous	1505 - 1552
7	Sandstone, very fine-grained, light gray	1552 - 1559
207	Shale, dark gray, sandy, sparingly fossiliferous	1559 - 1766
7	Sandstone, very fine-grained, light gray, fossiliferous and slightly calcareous	1766 - 1773
7	Shale, dark gray, sandy	1773 - 1780
7	Sandstone, very fine-grained, light gray, slightly calcareous	1780 - 1787
120	Shale, dark gray, sandy, sparingly fossiliferous	1787 - 1907
7	Sandstone, very fine-grained, light gray, slightly calcareous	1907 - 1914
337	Shale, dark gray to dark greenish gray, sandy, sparingly fossiliferous, with some interbedded gray to dark gray shale	1914 - 2251
161	Shale, dark gray	2251 - 2412
98	Shale, gray to dark gray, sandy, with a little interbedded grayish-black shale	2412 - 2510
42	Shale, gray	2510 - 2552
39	Shale, dark gray, sandy	2552 - 2591
277	Shale, gray to dark gray	2591 - 2868
85	Shale, gray, sandy	2868 - 2953

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
21	Shale, gray	2953 - 2974
66	Shale, dark gray, sandy	2974 - 3040
28	Shale, gray	3040 - 3068
20	Shale, dark gray, sandy	3068 - 3088
114	Shale, dark gray	3088 - 3202
101	Shale, dark gray, interbedded with dark gray sandy shale	3202 - 3303
35	Shale, dark gray	3303 - 3338
12	Shale, dark gray, sandy	3338 - 3350
13	Sandstone, very fine-grained, dark gray	3350 - 3363
53	Shale, dark gray, interbedded with dark gray sandy shale	3363 - 3416
27	Sandstone, very fine-grained, dark gray	3416 - 3443
32	Shale, interbedded dark gray and sandy shale	3443 - 3475
73	Shale, dark gray	3475 - 3548
107	Shale, dark gray, sandy	3548 - 3655
27	Shale, dark gray	3655 - 3682
35	Shale, dark gray, sandy	3682 - 3717
158	Shale, dark gray to very dark gray	3717 - 3875
133	Shale, dark gray, sandy, in part slightly calcareous; minute plant fragments at several horizons	3875 - 4008
132	Shale, very dark gray, somewhat calcareous, containing a few interbedded thin seams of grayish-black shale	4008 - 4140
92	Shale, very dark gray	4140 - 4232
6	Shale, grayish black	4232 - 4238
12	Shale, very dark gray	4238 - 4250

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Shale, grayish black	4250 - 4257
54	Shale, dark gray, slightly calcareous	4257 - 4311
24	Shale, grayish black, somewhat calcareous	4311 - 4335
153	Shale, grayish black	4335 - 4488
28	Shale, grayish black, somewhat calcareous	4488 - 4516
	Middle Devonian Series, 1003 feet	
	Tully limestone, 89 feet	
89	Limestone, dense, very dark brownish gray	4516 - 4605
	Hamilton group, 885 feet	
14	Shale, very dark gray, calcareous	4605 - 4619
21	Shale, dark gray, somewhat calcareous, small show of GAS at 4624	4619 - 4640
67	Shale, very dark gray, slightly calcareous	4640 - 4707
7	Shale, very dark gray, calcareous	4707 - 4714
100	Shale, very dark gray, very slightly calcareous	4714 - 4814
30	Shale, very dark gray, somewhat calcareous	4814 - 4844
18	Shale, very dark gray, very slightly calcareous	4844 - 4862
13	Shale, grayish black, slightly calcareous	4862 - 4875
14	Shale, very dark gray, slightly calcareous	4875 - 4889
8	Shale, grayish black, slightly calcareous	4889 - 4897
63	Shale, very dark gray, very slightly calcareous	4897 - 4960
8	Shale, grayish black, very slightly calcareous	4960 - 4968
34	Shale, very dark gray, very slightly calcareous	4968 - 5002
8	Shale, very dark gray	5002 - 5010

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Limestone, dense, very dark gray, argillaceous, interbedded with some very dark gray calcareous shale; fragment of crinoid stem, Centerfield	5010 - 5026
16	Shale, very dark gray, calcareous	5026 - 5042
46	Shale, black, slightly calcareous	5042 - 5088
33	Shale, grayish black, slightly calcareous	5088 - 5121
36	Shale, very dark gray, slightly calcareous	5121 - 5157
29	Shale, grayish black, somewhat calcareous	5157 - 5186
6	Shale, very dark gray, slightly calcareous	5186 - 5192
6	Shale, grayish black, slightly calcareous	5192 - 5198
12	Shale, very dark gray, slightly calcareous	5198 - 5210
43	Shale, grayish black, slightly calcareous	5210 - 5253
31	Shale, grayish black, calcareous	5253 - 5284
6	Shale, grayish black, somewhat calcareous	5284 - 5290
16	Shale, grayish black, calcareous	5290 - 5306
6	Shale, grayish black, somewhat calcareous	5306 - 5312
36	Shale, grayish black, calcareous	5312 - 5348
38	Shale, grayish black, slightly calcareous	5348 - 5386
16	Shale, grayish black	5386 - 5402
8	Shale, grayish black, slightly calcareous	5402 - 5410
6	Shale, grayish black, calcareous	5410 - 5416
18	Shale, grayish black, slightly calcareous	5416 - 5434
56	Shale, grayish black, somewhat calcareous	5434 - 5490
	Onondaga limestone, 29 feet	
29	Limestone, dense, very dark gray, with a little brown bentonitic shale in upper part	5490 - 5519

Wheeler No. 1

Thickness Feet	Description of Strata	Depth in feet
	Lower Devonian Series, 144+ feet	
	Oriskany sandstone, 61 feet	
37	Sandstone, fine-grained, light gray to brownish gray, calcareous throughout	5519 - 5556
15	Limestone, very fine-grained, dark brownish gray, sandy	5556 - 5571
6	Sandstone, fine-grained, light gray to gray, calcareous	5571 - 5577
3	Limestone, very fine-grained, dark gray, sandy	5577 - 5580
	Helderberg limestone, 83+ feet	
41	Limestone, very fine, crystalline, very dark gray, in part fossiliferous	5580 - 5621
42	Limestone, very fine, crystalline, brownish gray, in part fossiliferous and somewhat cherty	5621 - 5663
	TOTAL DEPTH	5663

WELL-SAMPLE RECORD
NO.
27

WELL-SAMPLE RECORD

LYLE E. SHOEMAKER NO. 1 WELL
LYCOMING NATURAL GAS CORPORATION

Tioga County, Pa., Lawrence Township
Tioga Quadrangle: 1.77 miles south of 42° 00' N. Lat. and 1.00 mile east of 77° 05' W. Long.
Completed: 1931
Elevation: 1474 feet above sea level.
Total depth: 7148 feet.
Result: Dry in Oriskany, no salt water.
Samples: 0 to 7148 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4097+ feet	
	Upper Devonian Series, 2909+ feet	
24	Soil	0 - 24
61	Sandstone, very fine-grained, bluish to greenish gray	24 - 85
89	Shale, bluish to greenish gray, sandy	85 - 174
12	Sandstone, very fine-grained, light greenish gray, slightly calcareous	174 - 186
135	Shale, greenish gray, sandy, slightly fossiliferous	186 - 321
6	Sandstone, very fine grained, dark grayish brown	321 - 327
6	Shale, greenish gray, sandy	327 - 333
17	Shale, brownish gray, sandy	333 - 350
22	Shale, greenish gray, sandy	350 - 372
6	Sandstone, very fine-grained, greenish gray	372 - 378

Thickness Feet	Description of Strata	Depth in feet
356	Shale, greenish gray, sandy, in part slightly calcareous and containing an occasional brachiopod	378 - 734
7	Sandstone, very fine-grained, dark brownish gray, somewhat calcareous	734 - 741
54	Shale, dark gray, interbedded with greenish-gray sandy shale	741 - 795
6	Sandstone, very fine-grained, dark greenish gray	795 - 801
96	Shale, greenish to dark greenish gray, sandy, with some interbedded dark gray shale	801 - 897
57	Shale, dark gray	897 - 954
54	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	954 - 1008
6	Sandstone, very fine-grained, dark greenish gray	1008 - 1014
6	Shale, greenish gray, sandy	1014 - 1020
6	Sandstone, very fine-grained, greenish gray	1020 - 1026
48	Shale, dark gray, with some interbedded greenish-gray shale	1026 - 1074
54	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	1074 - 1128
115	Shale, dark gray, with a little interbedded dark greenish-gray sandy shale	1128 - 1243
116	Shale, dark greenish gray, sandy, with some interbedded dark gray shale	1243 - 1359
14	Shale, very dark gray, almost black, with some interbedded dark greenish-gray sandy shale	1359 - 1373
37	Shale, dark greenish gray, sandy, with some interbedded very dark gray shale	1373 - 1410
86	Shale, dark greenish gray, sandy	1410 - 1496
97	Shale, dark gray, with some interbedded dark greenish-gray sandy shale	1496 - 1593

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
351	Shale, dark gray, sandy, interbedded with dark gray shale	1593 - 1944
24	Shale, grayish black, with some interbedded very dark gray shale	1944 - 1968
43	Shale, very dark gray, with some interbedded grayish-black shale	1968 - 2011
42	Shale, very dark brownish gray, sandy, with some interbedded very dark gray shale	2011 - 2053
7	Sandstone, very fine grained, very dark brownish gray, slightly calcareous	2053 - 2060
28	Shale, very dark brownish gray, slightly calcareous, sandy, interbedded with very dark gray shale	2060 - 2088
367	Shale, dark gray, sandy, interbedded with dark gray shale, slightly calcareous	2088 - 2455
40	Shale, very dark gray	2455 - 2495
37	Shale, dark gray, with some interbedded gray sandy shale	2495 - 2532
80	Shale, dark brownish gray, sandy, with some interbedded dark gray shale	2532 - 2612
52	Shale, gray to dark gray, sandy in upper part	2612 - 2664
37	Shale, gray to dark gray, somewhat calcareous	2664 - 2701
7	Sandstone, very fine-grained, dark gray, calcareous	2701 - 2708
20	Shale, dark gray, somewhat calcareous	2708 - 2728
22	Shale, gray to dark gray, calcareous	2728 - 2750
159	Shale, grayish black, very slightly calcareous	2750 - 2909
	Middle Devonian Series, 1021 feet	
	Tully limestone, 82 feet	
50	Limestone, dense, dark brownish gray, argillaceous	2909 - 2959

Thickness Feet	Description of Strata	Depth in feet
19	Shale, dark gray, somewhat calcareous	2959 - 2978
13	Limestone, dense, very dark brownish gray, argillaceous	2978 - 2991
	Hamilton group, 992 feet	
23	Shale, dark gray, somewhat calcareous	2991 - 3014
24	Shale, dark gray, slightly calcareous	3014 - 3038
14	Shale, dark gray, calcareous	3038 - 3052
45	Shale, dark gray, very calcareous	3052 - 3097
8	Shale, dark gray, somewhat calcareous	3097 - 3105
51	Shale, very dark gray, slightly calcareous	3105 - 3156
14	Shale, black, calcareous	3156 - 3170
22	Shale, very dark gray, calcareous	3170 - 3192
168	Shale, very dark gray, slightly calcareous	3192 - 3360
22	Shale, very dark gray, calcareous	3360 - 3382
29	Shale, very dark gray, very calcareous	3382 - 3411
21	Shale, very dark gray, calcareous, fragment of crinoid stem in lower part	3411 - 3432
16	Shale, very dark gray, very calcareous	3432 - 3448
8	Shale, very dark gray, calcareous	3448 - 3456
7	Shale, very dark gray, very calcareous	3456 - 3463
57	Shale, very dark gray, calcareous	3463 - 3520
72	Shale, grayish black, slightly calcareous	3520 - 3592
16	Shale, very dark gray, slightly calcareous	3592 - 3608
12	Shale, grayish black, very calcareous	3608 - 3620
8	Shale, very dark gray, very calcareous	3620 - 3628
64	Shale, grayish black, very calcareous	3628 - 3692

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, grayish black, calcareous	3692 - 3700
7	Shale, grayish black, very calcareous	3700 - 3707
62	Shale, grayish black, calcareous	3707 - 3769
8	Shale, grayish black, somewhat calcareous	3769 - 3777
15	Shale, grayish black, calcareous	3777 - 3792
16	Shale, grayish black, somewhat calcareous	3792 - 3808
7	Shale, grayish black, calcareous	3808 - 3815
15	Shale, grayish black, somewhat calcareous	3815 - 3830
8	Shale, grayish black, slightly calcareous	3830 - 3838
17	Shale, grayish black, calcareous	3838 - 3855
9	Shale, grayish black, slightly calcareous	3855 - 3864
15	Shale, grayish black, calcareous	3864 - 3879
22	Shale, grayish black, somewhat calcareous	3879 - 3901
7	Shale, grayish black, calcareous	3901 - 3908
5	Shale, grayish black, very calcareous	3908 - 3913
	Onondaga limestone, 17 feet	
17	Limestone, very fine, dense, gray to dark gray	3913 - 3930
	Lower Devonian Series, 167 feet	
	Oriskany sandstone, 50 feet	
38	Sandstone, medium-grained, light brownish gray, somewhat calcareous	3930 - 3968
12	Sandstone, medium-grained, dark brownish gray, calcareous	3968 - 3980
	Helderberg limestone, 117 feet	
95	Limestone, very fine, crystalline, dark brownish gray, fossiliferous, somewhat siliceous and cherty	3980 - 4075

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Limestone, very fine, crystalline, dark brownish gray, sandy, also contains some dark gray chert	4075 - 4080
17	Limestone, very fine, crystalline, brownish gray, contains a little light gray chert	4080 - 4097
	SILURIAN SYSTEM, 3051+ feet	
	Upper Silurian or Cayugan Series, 3051+ feet	
	Keyser limestone, 164 feet	
26	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian	4097 - 4123
24	Limestone, very fine, dense, dark brownish gray, argillaceous	4123 - 4147
21	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian	4147 - 4168
10	Limestone, very fine, crystalline, light gray, siliceous, magnesian	4168 - 4178
26	Limestone, very fine, crystalline, dark gray to brownish gray, argillaceous, magnesian	4178 - 4204
57	Limestone, very fine, dense, dark gray to brownish gray, argillaceous, with abundant crinoid stems near top	4204 - 4261
	Salina group, 2887 feet	
28	Anhydrite, very fine, crystalline, light gray	4261 - 4289
13	Shale, very fine, gray, somewhat calcareous	4289 - 4302
8	Anhydrite, very fine, crystalline, light gray	4302 - 4310
18	Shale, very dark gray, slightly calcareous	4310 - 4328
7	Anhydrite, very fine, crystalline, light gray	4328 - 4335

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Limestone, very fine, dense, brownish gray, argillaceous, magnesian	4335 - 4341
53	Shale, very dark gray, in part somewhat calcareous	4341 - 4394
5	Anhydrite, very fine, crystalline, brownish gray, somewhat calcareous	4394 - 4399
25	Shale, brownish gray, calcareous, contains some anhydrite	4399 - 4424
	Syracuse Salt member, 2084 feet	
36	Salt, coarse, crystalline, grayish white, with a little interbedded light gray shale	4424 - 4460
26	Shale, light gray to brownish gray, slightly calcareous	4460 - 4486
41	Salt, coarse, crystalline, grayish white, with a little interbedded light gray shale	4486 - 4527
6	Shale, light gray, slightly calcareous	4527 - 4533
209	Salt, coarse, crystalline, grayish white, with a little interbedded light gray shale	4533 - 4742
6	Shale, light brownish gray, somewhat calcareous	4742 - 4748
20	Salt, coarse, crystalline, grayish white, with a little interbedded light gray shale	4748 - 4768
22	Shale, gray, slightly calcareous	4768 - 4790
127	Salt, coarse, crystalline, grayish white, with a little interbedded light gray shale, in part calcareous	4790 - 4917
75	Shale, light gray, somewhat calcareous, with some interbedded salt	4917 - 4992
19	Salt, coarse, crystalline, grayish white, with some interbedded light gray shale, somewhat calcareous	4992 - 5011
14	Shale, light gray, somewhat calcareous	5011 - 5025

Thickness Feet	Description of Strata	Depth in feet
55	Salt, coarse, crystalline, grayish white, with some interbedded light gray to gray shale, somewhat calcareous	5025 - 5080
12	Shale, gray, calcareous	5080 - 5092
6	Salt, coarse, crystalline, grayish white	5092 - 5098
6	Shale, gray, somewhat calcareous	5098 - 5104
16	Salt, coarse, crystalline, grayish white, with some interbedded light gray shale, somewhat calcareous	5104 - 5120
6	Shale, light gray, slightly calcareous	5120 - 5126
6	Salt, coarse, crystalline, grayish white	5126 - 5132
26	Shale, light gray to brownish gray, somewhat calcareous	5132 - 5158
7	Salt, coarse, crystalline, grayish white	5158 - 5165
184	Shale, gray to dark gray, calcareous, with some interbedded anhydrite in upper part and salt in lower part	5165 - 5349
110	Salt, coarse, crystalline, grayish white, with a little interbedded gray shale, somewhat calcareous	5349 - 5459
6	Shale, gray, very calcareous, containing a little anhydrite	5459 - 5465
62	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian, containing a little anhydrite	5465 - 5527
25	Salt, coarse, crystalline, grayish white	5527 - 5552
7	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian	5552 - 5559
18	Shale, very dark gray, calcareous	5559 - 5577
24	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian, containing a little anhydrite	5577 - 5601
44	Salt, coarse, crystalline, grayish white, with a little interbedded brownish to dark brownish-gray shale, somewhat calcareous	5601 - 5645

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
13	Anhydrite, very fine, light gray, argillaceous, calcareous	5645 - 5658
32	Shale, light gray to brownish gray, somewhat calcareous, with some interbedded anhydrite	5658 - 5690
5	Anhydrite, very fine, light brownish gray, somewhat calcareous	5690 - 5695
87	Shale, light gray to gray, somewhat calcareous, containing some anhydrite in upper part	5695 - 5782
69	Limestone, very fine, crystalline, dark brownish gray, argillaceous, magnesian	5782 - 5851
12	Shale, light brownish gray, calcareous, contains some anhydrite	5851 - 5863
6	Limestone, very fine, dense, light to dark brownish gray, argillaceous	5863 - 5869
172	Shale, light to dark gray, calcareous, contains a little anhydrite	5869 - 6041
14	Salt, coarse, crystalline, grayish white, with some interbedded dark gray shale, somewhat calcareous	6041 - 6055
13	Shale, gray to dark gray, somewhat calcareous	6055 - 6068
19	Limestone, very fine, dense, dark brownish gray, argillaceous, magnesian	6068 - 6087
33	Limestone, very fine, dense, very dark brownish gray, argillaceous	6087 - 6120
14	Salt, coarse, crystalline, grayish white, with some interbedded gray shale, somewhat calcareous	6120 - 6134
13	Shale, brownish gray, very calcareous	6134 - 6147
19	Salt, coarse, crystalline, grayish white, with a little interbedded dark gray shale, somewhat calcareous	6147 - 6166
24	Limestone, very fine, dense, very dark brownish gray, argillaceous, magnesian	6166 - 6190

Thickness Feet	Description of Strata	Depth in feet
6	Dolomite, very fine, dense, very dark brownish gray, argillaceous	6190 - 6196
37	Shale, gray, calcareous	6196 - 6233
94	Salt, coarse, crystalline, grayish white	6233 - 6327
8	Limestone, very fine, dense, very dark brownish gray, argillaceous	6327 - 6335
7	Shale, light gray, very calcareous	6335 - 6342
7	Salt, coarse, crystalline, grayish white	6342 - 6349
9	Shale, gray, somewhat calcareous	6349 - 6358
60	Salt, coarse, crystalline, grayish white, with a little interbedded gray shale, somewhat calcareous	6358 - 6418
29	Shale, dark brownish gray, very calcareous	6418 - 6447
6	Salt, coarse, crystalline, grayish white, with considerable interbedded dark gray shale, somewhat calcareous	6447 - 6453
36	Shale, dark brownish gray, very calcareous	6453 - 6489
19	Salt, coarse, crystalline, grayish white, with a little interbedded dark gray shale, somewhat calcareous	6489 - 6508
	Bottom of Syracuse Salt member	6508
11	Limestone, very fine, dense, very dark brownish gray, argillaceous	6508 - 6519
11	Shale, gray to brownish gray, calcareous	6519 - 6530
114	Shale, light greenish gray, somewhat calcareous	6530 - 6644
44	Shale, light greenish gray, slightly calcareous	6644 - 6688
44	Shale, light greenish gray	6688 - 6732
43	Shale, light greenish gray, slightly calcareous	6732 - 6775

Shoemaker No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Shale, dark gray, somewhat calcareous; contains a little anhydrite	6775 - 6805
76	Shale, light greenish gray, slightly calcareous	6805 - 6881
144	Shale, dark gray, with interbedded light greenish gray shale, somewhat calcareous	6881 - 7025
	Vernon shale member, 123+ feet	
9	Shale, light greenish gray, somewhat calcareous, with some interbedded brownish-red shale, also somewhat calcareous	7025 - 7034
91	Shale, purplish red, somewhat calcareous, (2-inch anhydrite seam or lens at 7060 feet)	7034 - 7125
23	Shale, purplish red, slightly calcareous	7125 - 7148
	TOTAL DEPTH	7148

WELL-SAMPLE RECORD

NO.

28

WELL-SAMPLE RECORD

G. H. HETTICK NO. 1 WELL
PENN-YORK NATURAL GAS CORPORATION

Bradford County, Pa., Towanda Township
Monroeton Quadrangle: .92 mile south of 41° 45' N. Lat. and .33 mile east of 76° 30' W. Long.
Completed: January 30, 1932.
Elevation: 1280 feet above sea level.
Total depth: 5227 feet
Result: Dry in Oriskany, no salt water.
Samples: 230 to 5227 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 5227+ feet	
	Upper Devonian Series, 3215+ feet	
230	No samples	0 - 230
11	Sandstone, very fine-grained, greenish gray, platy, slightly calcareous	230 - 241
8	Shale, greenish gray, sandy	241 - 249
70	Sandstone, very fine-grained, greenish to dark greenish gray, fossiliferous	249 - 319
12	Shale, dark greenish gray, sandy	319 - 331
72	Sandstone, very fine-grained, dark greenish gray, slightly calcareous, with a little interbedded dark greenish-gray sandy shale	331 - 403
50	Sandstone, very fine-grained, greenish gray	403 - 453
51	Shale, dark gray, sandy	453 - 504
31	Sandstone, very fine-grained, very dark greenish gray, slightly calcareous, with a little interbedded dark gray sandy shale	504 - 535

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Sandstone, very fine-grained, very dark greenish and brownish gray, slightly calcareous	535 - 565
9	Shale, very dark brownish gray, sandy	565 - 574
51	Shale, dark gray, sandy	574 - 625
20	Sandstone, very fine-grained, dark greenish gray, slightly calcareous	625 - 645
11	Shale, dark gray, sandy	645 - 656
19	Sandstone, very fine-grained, dark greenish gray	656 - 675
6	Shale, dark gray, sandy	675 - 681
24	Sandstone, very fine-grained, dark greenish gray, slightly calcareous	681 - 705
40	Shale, dark greenish gray, sandy	705 - 745
37	Sandstone, very fine-grained, dark greenish gray	745 - 782
19	Shale, dark greenish gray, sandy	782 - 801
23	Sandstone, very fine-grained, dark greenish gray	801 - 824
45	Shale, dark greenish gray, sandy	824 - 869
46	Sandstone, very fine-grained, dark greenish gray	869 - 915
5	Shale, dark gray, sandy	915 - 920
22	Sandstone, very fine-grained, dark greenish gray	920 - 942
43	Shale, dark gray, sandy	942 - 985
20	Shale, dark gray	985 - 1005
55	Shale, dark gray, sandy	1005 - 1060
25	Sandstone, very fine-grained, dark greenish gray	1060 - 1085
31	Shale, dark greenish gray, sandy	1085 - 1116

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
44	Shale, dark gray, sandy	1116 - 1160
11	Shale, dark gray	1160 - 1171
44	Shale, dark gray, sandy	1171 - 1215
20	Shale, dark greenish gray, sandy	1215 - 1235
159	Shale, dark gray, sandy	1235 - 1394
9	Sandstone, very fine-grained, dark gray	1394 - 1403
32	Shale, dark gray, with some interbedded dark gray sandy shale	1403 - 1435
10	Sandstone, very fine-grained, dark gray, slightly calcareous	1435 - 1445
17	Shale, dark gray, sandy	1445 - 1462
9	Sandstone, very fine-grained, dark gray	1462 - 1471
49	Shale, dark gray, sandy, with some interbedded very dark gray shale	1471 - 1520
31	Shale and sandy shale, dark gray, interbedded	1520 - 1551
13	Sandstone, very fine-grained, dark greenish gray, slightly calcareous	1551 - 1564
6	Shale, dark greenish gray, sandy	1564 - 1570
49	Shale, dark gray	1570 - 1619
61	Shale, dark gray, sandy	1619 - 1680
13	Sandstone, very fine-grained, dark gray	1680 - 1693
16	Shale, dark gray, sandy	1693 - 1709
18	Sandstone, very fine-grained, dark gray, slightly calcareous	1709 - 1727
54	Shale, dark gray, sandy	1727 - 1781
9	Shale, dark gray	1781 - 1790
18	Sandstone, very fine-grained, dark gray, slightly calcareous	1790 - 1808

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
35	Shale, dark greenish gray, sandy, slightly calcareous	1808 - 1843
10	Sandstone, very fine-grained, dark greenish gray, somewhat calcareous	1843 - 1853
5	Shale, dark greenish gray, sandy	1853 - 1858
22	Sandstone, very fine-grained, dark greenish gray, somewhat calcareous	1858 - 1880
5	Shale, dark greenish gray, sandy	1880 - 1885
27	Sandstone, very fine-grained, dark greenish gray	1885 - 1912
25	Shale, dark greenish gray, sandy	1912 - 1937
10	Sandstone, very fine-grained, greenish gray	1937 - 1947
3	Shale, dark greenish gray, sandy, fossiliferous	1947 - 1950
9	Sandstone, very fine-grained, dark greenish gray, somewhat calcareous	1950 - 1959
2	Shale, dark greenish gray, sandy	1959 - 1961
27	Sandstone, very fine-grained, dark greenish gray, slightly calcareous	1961 - 1988
11	Shale, dark gray, sandy	1988 - 1999
12	Sandstone, very fine-grained, dark greenish gray	1999 - 2011
6	Shale, dark gray, sandy	2011 - 2017
13	Sandstone, very fine-grained, dark greenish gray, slightly calcareous	2017 - 2030
15	Shale, dark gray, sandy	2030 - 2045
30	Sandstone, very fine-grained, dark gray, slightly calcareous	2045 - 2075
14	Sandstone, very fine-grained, gray	2075 - 2089
11	Sandstone, very fine-grained, dark gray	2089 - 2100

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Shale, dark gray, sandy	2100 - 2105
5	Sandstone, very fine-grained, gray, slightly calcareous	2105 - 2110
15	Shale, dark gray, sandy	2110 - 2125
25	Sandstone, very fine-grained, dark gray, slightly calcareous	2125 - 2150
7	Shale, dark gray, sandy	2150 - 2157
19	Sandstone, very fine-grained, dark gray, slightly calcareous	2157 - 2176
9	Shale, dark gray	2176 - 2185
23	Shale, dark gray, sandy	2185 - 2208
22	Sandstone, very fine-grained, dark brownish gray, slightly calcareous	2208 - 2230
44	Shale, dark gray, sandy	2230 - 2274
23	Shale, dark brownish gray, sandy	2274 - 2297
29	Shale, dark gray, sandy	2297 - 2326
11	Sandstone, very fine-grained, brownish gray, slightly calcareous	2326 - 2337
13	Shale, dark gray, sandy	2337 - 2350
13	Shale, dark gray	2350 - 2363
18	Shale, dark brownish gray, sandy	2363 - 2381
30	Shale, very dark gray, sandy	2381 - 2411
4	Shale, very dark gray, almost black	2411 - 2415
8	Shale, dark brownish gray, sandy	2415 - 2423
52	Shale, very dark gray, sandy	2423 - 2475
8	Shale, very dark brownish gray, sandy	2475 - 2483
21	Shale, gray	2483 - 2504
42	Shale, very dark gray, sandy	2504 - 2546

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Shale, dark gray	2546 - 2566
33	Shale, very dark gray, sandy	2566 - 2599
23	Shale, dark gray	2599 - 2622
19	Shale, dark gray, sandy	2622 - 2641
14	Shale, dark gray	2641 - 2655
12	Shale, dark gray, sandy, fossiliferous	2655 - 2667
200	Shale, dark gray	2667 - 2867
83	Shale, very dark gray	2867 - 2950
45	Shale, dark gray	2950 - 2995
65	Shale, very dark gray, almost black	2995 - 3060
28	Shale, grayish black	3060 - 3088
44	Shale, very dark gray, almost black	3088 - 3132
32	Shale, grayish black	3132 - 3164
13	Shale, black	3164 - 3177
38	Shale, grayish black	3177 - 3215
	Middle Devonian Series, 1949 feet	
	Tully limestone, 129 feet	
79	Limestone, very fine, dense, dark gray	3215 - 3294
50	Limestone, very fine, dense, very dark brownish gray	3294 - 3344
	Hamilton group, 1591 feet	
24	Shale, very dark gray, calcareous	3344 - 3368
43	Shale, very dark gray	3368 - 3411
30	Shale, very dark gray, somewhat calcareous	3411 - 3441
28	Shale, very dark gray	3441 - 3469
8	Shale, very dark gray, calcareous	3469 - 3477

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
108	Shale, very dark gray	3477 - 3585
11	Shale, grayish black	3585 - 3596
11	Shale, very dark gray	3596 - 3607
50	Shale, very dark gray, calcareous	3607 - 3657
196	Shale, very dark gray	3657 - 3853
8	Limestone, very fine, dense, very dark gray, fossiliferous, Centerfield	3853 - 3861
283	Shale, very dark gray	3861 - 4144
18	Shale, dark gray, somewhat calcareous	4144 - 4162
99	Shale, very dark gray	4162 - 4261
5	Shale, very dark gray, somewhat calcareous	4261 - 4266
12	Shale, grayish black, slightly calcareous	4266 - 4278
49	Shale, very dark gray, somewhat calcareous	4278 - 4327
8	Shale, grayish black, calcareous	4327 - 4335
35	Shale, very dark gray, somewhat calcareous	4335 - 4370
5	Shale, very dark gray, calcareous	4370 - 4375
36	Shale, very dark gray, somewhat calcareous	4375 - 4411
15	Shale, grayish black, calcareous	4411 - 4426
41	Shale, very dark gray, calcareous	4426 - 4467
48	Shale, very dark gray, slightly calcareous	4467 - 4515
30	Shale, very dark gray, calcareous and fossiliferous	4515 - 4545
35	Shale, very dark gray, somewhat calcareous	4545 - 4580

Thickness Feet	Description of Strata	Depth in feet
37	Shale, very dark gray, calcareous	4580 - 4617
52	Shale, very dark gray, slightly calcareous	4617 - 4669
118	Shale, grayish black and black	4669 - 4787
23	Shale, grayish black, calcareous	4787 - 4810
73	Shale, grayish black	4810 - 4883
38	Shale, grayish black, slightly calcareous	4883 - 4921
7	Shale, grayish black, somewhat calcareous	4921 - 4928
7	Shale, very dark gray, calcareous	4928 - 4935
	Onondaga formation, 229 feet	
18	Limestone, very fine, dense, very dark gray	4935 - 4953
2	Shale, very dark gray, calcareous	4953 - 4955
3	Limestone, very fine, dense, brownish gray	4955 - 4958
3	Shale, very dark gray, calcareous	4958 - 4961
7	Limestone, very fine, dense, brownish gray	4961 - 4968
11	Shale, dark gray, calcareous	4968 - 4979
11	Limestone, very fine, dense, dark gray, argillaceous	4979 - 4990
5	Shale, dark gray, calcareous	4990 - 4995
16	Shale, dark gray, slightly calcareous	4995 - 5011
9	Limestone, very fine, dense, gray, argillaceous	5011 - 5020
5	Shale, dark gray, calcareous	5020 - 5025
9	Limestone, very fine, dense, dark brownish gray	5025 - 5034
20	Shale, dark gray, calcareous	5034 - 5054

Hettick No. 1

Thickness Feet	Description of Strata	Depth in feet
2	Limestone, very fine, dense, dark gray	5054 - 5056
5	Shale, dark gray, calcareous	5056 - 5061
3	Shale, dark gray, slightly calcareous	5061 - 5064
2	Limestone, very fine, dense, dark brownish gray	5064 - 5066
8	Shale, dark gray, somewhat calcareous	5066 - 5074
21	Shale, dark gray	5074 - 5095
69	Shale, very dark gray	5095 - 5164
	Lower Devonian Series, 63+ feet	
	Oriskany sandstone, 63+ feet	
10	Sandstone, medium-grained, light gray, calcareous	5164 - 5174
53	Limestone, sandy	5174 - 5227
	TOTAL DEPTH	5227

WELL-SAMPLE RECORD
NO.
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WELL-SAMPLE RECORD

SERIAL NUMBER 807 WELL
IROQUOIS GAS CORPORATION

Erie County, New York, Town of Evans
Silver Creek Quadrangle: .98 mile north of 42° 40' N. Lat. and 1.89 mi. east of 79° 5' W. Long.
Completed: 1925
Elevation: 600 feet.
Total depth: 1474 feet.
Deepest formation: Queenston
Result: Very small show of gas at 1461 feet in Whirlpool sandstone.
Samples: 25 to 1474 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 630+ feet	
	Upper Devonian Series, 100+ feet	
25	No samples	0 - 25
28	Shale, grayish-black	25 - 53
20	Shale, light-gray, with some interbedded grayish-black shale	53 - 73
27	Shale, grayish-black, with some interbedded dark to very dark gray shale	73 - 100
	Middle Devonian Series, 530 feet	
	Hamilton group, 343 feet	
8	Shale, gray, slightly calcareous	100 - 108
46	Shale, gray to dark-gray	108 - 154
30	Shale, dark brownish gray, slightly calcareous, with a little interbedded grayish-black shale	154 - 184
30	Shale, gray to dark-gray, slightly calcareous, containing fragments of shells including brachiopods	184 - 214

Thickness Feet	Description of Strata	Depth in feet
34	Shale, dark-gray, somewhat calcareous	214 - 248
36	Shale, dark-gray, slightly calcareous	248 - 284
11	Limestone, very fine, clastic, dark grayish brown, argillaceous	284 - 295
5	Shale, dark brownish gray, somewhat calcareous	295 - 300
10	Shale, very dark gray, somewhat calcareous	300 - 310
33	Shale, dark-gray	310 - 343
9	Shale, dark-gray, calcareous	343 - 352
6	Shale, dark brownish gray, calcareous	352 - 358
24	Shale, brownish-black, somewhat calcareous	358 - 382
15	Limestone, very fine, crystalline, light brownish gray to grayish-brown, argillaceous and somewhat cherty	382 - 397
1	Shale, brownish-black, calcareous	397 - 398
12	Shale, dark-gray, somewhat calcareous	398 - 410
12	Shale, dark-gray, slightly calcareous	410 - 422
5	Shale, dark-gray	422 - 427
16	Shale, black, containing a little pyrite	427 - 443
	Onondaga limestone, 187 feet	
19	Limestone, very fine, crystalline, light grayish brown, somewhat cherty	443 - 462
31	Limestone, very fine, crystalline, grayish-brown, containing considerable chert and occasional shell fragments	462 - 493
18	Limestone, very fine, crystalline, light grayish brown, containing some chert	493 - 511
33	Limestone, very fine, crystalline, grayish to dark grayish brown, containing considerable chert	511 - 544
26	Limestone, very fine, crystalline, light grayish brown, containing considerable chert and a little drusy quartz	544 - 570

No. 807

Thickness Feet	Description of Strata	Depth in feet
39	Limestone, very fine, crystalline, grayish to dark grayish brown, containing considerable chert	570 - 609
11	Limestone, very fine, crystalline, light grayish brown, containing considerable chert	609 - 620
10	Limestone, very fine, crystalline, brownish-gray, somewhat magnesian, containing considerable chert	620 - 630
	SILURIAN SYSTEM	
	Upper Silurian or Cayugan Series, 446 feet	
	Cobleskill limestone, 15 feet	
15	Limestone, very fine, crystalline, dark brownish gray, argillaceous and dolomitic	630 - 645
	Salina group, 433 feet	
28	Limestone, very fine, crystalline, light to very dark brownish gray, argillaceous and dolomitic, Bertie	645 - 673
19	Limestone, very fine, clastic, brownish-gray, very argillaceous and somewhat magnesian, containing a little anhydrite	673 - 692
28	Shale, gray to dark-gray, calcareous and dolomitic, containing a little anhydrite	692 - 720
18	Limestone, very fine, clastic, light grayish brown, dolomitic and somewhat argillaceous, containing a little anhydrite	720 - 738
6	Limestone, very fine, clastic, dark brownish gray, argillaceous and dolomitic, containing a little anhydrite	738 - 744
18	Limestone, very fine, clastic, brown, dolomitic and somewhat argillaceous, containing a little anhydrite	744 - 762
19	Limestone, very fine, clastic, dark grayish brown, dolomitic and somewhat argillaceous, containing a little anhydrite	762 - 781
13	Limestone, very fine, clastic, light grayish brown, dolomitic and somewhat argillaceous, containing some anhydrite	781 - 794

Thickness Feet	Description of Strata	Depth in feet
36	Limestone, very fine, clastic, grayish-brown, dolomitic and somewhat argillaceous, containing a little anhydrite	794 - 830
18	Limestone, very fine, clastic, dark brownish gray, argillaceous and dolomitic	830 - 848
16	Limestone, very fine, clastic, dark-gray to dark brownish gray, argillaceous and dolomitic, containing a little anhydrite	848 - 864
12	Shale, gray, containing a little anhydrite	864 - 876
19	Shale, greenish to dark greenish gray, slightly calcareous	876 - 895
7	Limestone, very fine, clastic, brown to dark-brown, argillaceous and dolomitic, containing some anhydrite	895 - 902
14	Shale, dark greenish gray	902 - 916
10	Limestone, very fine, clastic, grayish-brown, argillaceous and dolomitic, containing some anhydrite	916 - 926
28	Shale, dark brownish gray, somewhat dolomitic, with some interbedded greenish-gray shale	926 - 954
22	Limestone, very fine, clastic, dark grayish brown, argillaceous and dolomitic, containing a little anhydrite	954 - 976
30	Shale, greenish-gray, with some interbedded very fine, clastic, light to dark grayish brown argillaceous and dolomitic limestone	976 - 1006
12	Limestone, very fine, clastic, dark grayish brown, argillaceous and dolomitic, containing a little anhydrite	1006 - 1018
6	Limestone, very fine, clastic, light-gray to grayish-brown, argillaceous and dolomitic	1018 - 1024
7	Limestone, very fine, clastic, dark grayish brown, argillaceous and dolomitic	1024 - 1031
24	Dolomite, very fine, crystalline, dark grayish brown, somewhat argillaceous, containing some anhydrite	1031 - 1055

No. 807

Thickness Feet	Description of Strata	Depth in feet
23	Limestone, very fine, clastic, light brownish to brownish-gray, argillaceous and dolomitic	1055 - 1078
	Middle Silurian or Niagaran Series, 271 feet	
	Lockport-Guelph group, 162 feet	
10	Limestone, very fine, crystalline, dark-brown, dolomitic and somewhat argillaceous	1078 - 1088
16	Dolomite, very fine, crystalline, dark-brown	1088 - 1104
11	Dolomite, very fine, crystalline, very dark brown	1104 - 1115
12	Limestone, very fine, crystalline, very dark brown, dolomitic	1115 - 1127
3	Dolomite, very fine, crystalline, dark-brown, somewhat argillaceous	1127 - 1130
41	Limestone, very fine, crystalline, grayish-brown to dark-brown, dolomitic	1130 - 1171
5	Limestone, very fine, crystalline, dark-brown, dolomitic and somewhat argillaceous	1171 - 1176
22	Limestone, very fine, crystalline, very light gray, dolomitic	1176 - 1198
6	Limestone, very fine, crystalline, brownish-gray, dolomitic	1198 - 1204
5	Dolomite, very fine, crystalline, light-gray	1204 - 1209
31	Limestone, fine, crystalline, dark grayish brown, containing a few very fine angular quartz grains	1209 - 1240
	Clinton group, 109 feet	
23	Shale, dark-gray, slightly calcareous	1240 - 1263
57	Shale, dark-gray	1263 - 1320
6	Limestone, very fine, crystalline, very light gray, almost white, magnesian	1320 - 1326
3	Shale, gray	1326 - 1329
13	Limestone, fine, crystalline, gray, magnesian	1329 - 1342

Thickness Feet	Description of Strata	Depth in feet
2	Shale, dark-gray	1342 - 1344
5	Sandstone, fine-grained, light-gray, calcareous, Thorold	1344 - 1349
	Lower Silurian or Albion Series, 121 feet	
	Grimsby member, 71 feet	
6	Shale, brick-red, sandy and slightly calcareous	1349 - 1355
21	Shale, brick-red, sandy, with some interbedded fine-grained light-gray sandstone	1355 - 1376
4	Sandstone, fine-grained, brick-red, with some interbedded fine-grained light-gray sandstone	1376 - 1380
14	Sandstone, fine-grained, brick-red, with a great deal of interbedded fine-grained light-gray sandstone	1380 - 1394
3	Sandstone, fine-grained, brick-red with some interbedded fine-grained light-gray sandstone	1394 - 1397
7	Sandstone, fine-grained, light-gray, with some interbedded fine-grained brick-red sandstone	1397 - 1404
5	Sandstone, fine-grained, brick-red	1404 - 1409
11	Shale, brick-red, sandy, with a little interbedded fine-grained light-gray sandstone	1409 - 1420
	Cabot Head member, 39 feet	
8	Sandstone, fine-grained, light-gray, almost white	1420 - 1428
7	Shale, gray	1428 - 1435
13	Shale, gray, with a little interbedded fine-grained light-gray calcareous sandstone	1435 - 1448
4	Sandstone, fine-grained, light-gray, with some interbedded gray shale	1448 - 1452
7	Shale, gray, with some interbedded fine-grained light-gray	1452 - 1459
	Whirlpool sandstone, 11 feet	
11	Sandstone, fine-grained, nearly white, slightly calcareous, very small show of GAS at 1461 feet	1459 - 147(

No. 807

Thickness Feet	Description of Strata	Depth in feet
	ORDOVICIAN SYSTEM, 4+ feet	
	Upper Ordovician or Cincinnatian Series, 4+ feet	
	Queenston shale, 4+ feet	
4	Shale, brick-red, with a little interbedded greenish-gray shale	1470 - 1474
	TOTAL DEPTH	1474

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

SERIAL NUMBER 796 WELL
IROQUOIS GAS CORPORATION

Erie County, New York, Town of Concord
Eden Quadrangle: .54 mile north of 42° 35' N. Lat. and .20 mile west of 78° 45' W. Long.
Completed: 1925
Elevation: 1560 feet above sea level.
Total depth: 2908 feet.
Deepest formation: Queenston.
Result: Shows of gas at 531, 540, and 670 feet in Upper Devonian shales; show of gas at 1977, show of salt water at 1992 and show of oil at 1997 feet in Bertie limestone; show of gas at 2524 feet and considerable salt water at 2531 feet in Lockport dolomite; 25 gallons of salt water per hour at 2884 feet in Whirlpool sandstone. No commercial production of oil or gas encountered.
Samples: 42 to 2908 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 1970+ feet	
	Upper Devonian Series, 1469+ feet	
42	No samples	0 - 42
74	Sandstone, very fine grained, light-gray, somewhat micaceous, with a little interbedded very dark gray shale, Laona sandstone	42 - 116
37	Shale, gray, sandy, with a little interbedded very fine grained gray sandstone	116 - 153
7	Sandstone, very fine grained, gray, slightly calcareous, with some interbedded gray sandy shale	153 - 160
15	Shale, gray, sandy	160 - 175
6	Sandstone, very fine grained, light-gray, slightly calcareous, with some interbedded gray shale	175 - 181
33	Shale, gray, with a little interbedded very fine grained gray sandstone and dark-gray sandy shale	181 - 214

No. 796

Thickness Feet	Description of Strata	Depth in feet
6	Shale, dark-gray, sandy	214 - 220
36	Shale, gray, with some interbedded very fine grained gray calcareous sandstone	220 - 256
66	Shale, gray	256 - 322
19	Shale, gray, sandy	322 - 341
25	Shale, gray, with some interbedded very fine grained gray calcareous sandstone	341 - 366
6	Sandstone, very fine grained, gray, calcareous, with some interbedded very dark gray shale	366 - 372
43	Shale, gray, with some interbedded very dark gray sandy shale and a little very fine grained gray calcareous sandstone	372 - 415
7	Shale, gray, sandy, with some interbedded very fine grained gray calcareous sandstone	415 - 422
15	Shale, gray, with some interbedded gray sandy shale and a little very fine grained gray calcareous sandstone	422 - 437
54	Shale, very dark gray, sandy, with a little interbedded very fine grained gray sandstone and gray shale	437 - 491
6	Sandstone, very fine grained, light-gray to gray, calcareous, with some interbedded very dark gray sandy shale	491 - 497
20	Shale, gray, with a great deal of interbedded very dark gray sandy shale	497 - 517
7	Sandstone, very fine grained, gray, calcareous, with some interbedded very dark gray sandy shale	517 - 524
6	Shale, gray	524 - 530
7	Shale, very dark gray, sandy, with some interbedded very fine grained somewhat calcareous sandstone, show of GAS at 531 feet	530 - 537
25	Shale, gray, with some interbedded very dark gray sandy shale, show of GAS at 540 feet	537 - 562

No. 796

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, very fine grained, gray, somewhat calcareous, with some interbedded gray shale	562 - 574
6	Shale, very dark gray, sandy	574 - 580
6	Sandstone, very fine grained, gray, somewhat calcareous, with some interbedded very dark gray sandy shale	580 - 586
14	Shale, gray, in part sandy	586 - 600
7	Sandstone, very fine grained, gray, somewhat calcareous, with some interbedded very dark gray sandy shale	600 - 607
123	Shale, grayish-black, sandy, show of GAS at 670 feet, Dunkirk	607 - 730
7	Shale, gray	730 - 737
46	Sandstone, very fine grained, light-gray to greenish-gray, with some interbedded grayish-black sandy shale	737 - 783
14	Shale, greenish-gray, sandy, with some interbedded grayish-black sandy shale	783 - 797
13	Shale, gray, sandy	797 - 810
6	Sandstone, very fine grained, gray with some interbedded gray sandy shale	810 - 816
19	Shale, grayish-black, sandy, with some interbedded gray sandy shale	816 - 835
11	Shale, black	835 - 846
9	Shale, gray, sandy	846 - 855
11	Sandstone, very fine grained, gray, somewhat calcareous, with some interbedded gray sandy shale	855 - 866
21	Shale, gray, sandy, with some interbedded very fine grained gray sandstone	866 - 887
6	Sandstone, very fine grained, somewhat calcareous, with some interbedded gray sandy shale	887 - 893
34	Shale, gray, sandy, with a little interbedded very fine grained gray, somewhat calcareous sandstone	893 - 927

Thickness Feet	Description of Strata	Depth in feet
7	Sandstone, very fine grained, greenish-gray, somewhat calcareous	927 - 934
100	Shale, gray, in part sandy	934 - 1034
7	Sandstone, very fine grained, gray, somewhat calcareous	1034 - 1041
70	Shale, gray, in part sandy	1041 - 1111
21	Shale, grayish-black, with some interbedded gray shale	1111 - 1132
21	Shale, gray, with some interbedded grayish-black shale	1132 - 1153
161	Shale, grayish-black	1153 - 1314
14	Shale, dark-gray	1314 - 1328
7	Shale, grayish-black	1328 - 1335
58	Shale, gray	1335 - 1393
26	Shale, dark-gray	1393 - 1419
35	Shale, black	1419 - 1454
7	Shale, brownish-gray, very calcareous	1454 - 1461
5	Shale, gray, very calcareous	1461 - 1466
3	Limestone, very fine, dense, gray, Genundewa	1466 - 1469
	Middle Devonian Series, 501 feet	
	Hamilton group, 341 feet	
26	Shale, gray, fossiliferous in lower part	1469 - 1495
13	Limestone, dense, brownish-gray, fossiliferous, with some interbedded gray shale, Tichenor	1495 - 1508
69	Shale, dark-gray	1508 - 1577
14	Shale, dark-gray, somewhat calcareous	1577 - 1591
14	Shale, very dark gray, calcareous	1591 - 1605
79	Shale, dark-gray	1605 - 1684

No. 796

Thickness Feet	Description of Strata	Depth in feet
14	Shale, dark-gray, calcareous	1684 - 1698
7	Limestone, very fine, crystalline, dark brownish-gray	1698 - 1705
21	Shale, black, somewhat calcareous	1705 - 1726
12	Shale, black	1726 - 1738
21	Shale, dark-gray, in part calcareous	1738 - 1759
7	Limestone, dense, brownish-gray, with interbedded dark-gray calcareous shale	1759 - 1766
14	Shale, very dark gray, calcareous	1766 - 1780
7	Shale, very dark gray	1780 - 1787
23	Shale, black	1787 - 1810
	Onondaga limestone, 160 feet	
160	Limestone, very fine, crystalline, grayish-brown, fossiliferous, cherty	1810 - 1970
	SILURIAN SYSTEM, 920 feet	
	Upper Silurian or Cayugan Series, 496 feet	
	Cobleskill limestone, 6 feet	
6	Limestone, very fine, crystalline, grayish-brown, siliceous, magnesian	1970 - 1976
	Salina group, 490 feet	
47	Limestone, very fine, crystalline, light grayish-brown to dark grayish-brown, argillaceous, magnesian, Bertie; shows of GAS at 1977; SALT WATER, 1992; and oil, 1997 feet	1976 - 2023
12	Limestone, very fine, crystalline, brownish-gray, argillaceous, containing a little anhydrite	2023 - 2035
6	Shale, gray, calcareous	2035 - 2041
62	Limestone, very fine, crystalline, gray to dark-gray, argillaceous, containing a little anhydrite	2041 - 2103

No. 796

Thickness Feet	Description of Strata	Depth in feet
135	Limestone, very fine, crystalline, grayish-brown to dark brownish-gray, argillaceous, magnesian, containing a little anhydrite	2103 - 2238
43	Shale, greenish-gray, slightly calcareous	2238 - 2281
7	Limestone, very fine, crystalline, dark brown, argillaceous, containing a little anhydrite	2281 - 2288
7	Shale, greenish-gray	2288 - 2295
7	Limestone, very fine, crystalline, dark brownish-gray, argillaceous	2295 - 2302
7	Shale, dark greenish-gray	2302 - 2309
52	Limestone, very fine, crystalline, dark grayish-brown, argillaceous	2309 - 2361
26	Limestone, very fine, crystalline, light brownish-gray, argillaceous, magnesian	2361 - 2387
13	Shale, dark grayish-green	2387 - 2400
44	Limestone, very fine, crystalline, dark grayish-brown, argillaceous, magnesian, containing some anhydrite	2400 - 2444
22	Shale, dark greenish-gray, slightly calcareous and containing a little anhydrite	2444 - 2466
	Middle Silurian or Niagaran Series, 316 feet	
	Lockport-Guelph group, 195 feet	
68	Dolomite, very fine, crystalline, dark-brown, show of GAS at 2524; considerable SALT WATER at 2531 feet	2466 - 2534
104	Limestone, very fine, crystalline, dark-brown to very dark grayish brown, magnesian	2534 - 2638
23	Limestone, very fine, crystalline, dark grayish-brown, argillaceous	2638 - 2661
	Clinton group, 121 feet	
43	Shale, dark-gray	2661 - 2704
47	Shale, gray, slightly calcareous	2704 - 2751

No. 796

Thickness Feet	Description of Strata	Depth in feet
5	Limestone, very fine, crystalline, light-gray, magnesian	2751 - 2756
5	Shale, gray, slightly calcareous	2756 - 2761
5	Limestone, very fine, crystalline, light-gray, magnesian	2761 - 2766
6	Shale, greenish-gray	2766 - 2772
10	Sandstone, fine-grained, greenish-gray to white, Thorold	2772 - 2782
	Lower Silurian or Albion Series, 108 feet	
	Grimsby member, 94 feet	
7	Shale, brick-red, sandy	2782 - 2789
14	Sandstone, fine-grained, brick-red	2789 - 2803
14	Shale, brick-red, sandy	2803 - 2817
7	Sandstone, fine-grained, brick-red	2817 - 2824
42	Sandstone, fine-grained, white	2824 - 2866
10	Shale, brick-red, sandy	2866 - 2876
	Cabot Head shale, 4 feet	
4	Shale, gray, sandy	2876 - 2880
	Whirlpool sandstone, 10 feet	
10	Sandstone, fine-grained, white, 25 gallons of SALT WATER per hour at 2884	2880 - 2890
	ORDOVICIAN SYSTEM, 18+ feet	
	Upper Ordovician or Cincinnatian Series, 18+ feet	
	Queenston shale, 18+ feet	
18	Shale, brick-red, sandy	2890 - 2908
	TOTAL DEPTH	2908

WELL-SAMPLE RECORD
NO.
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WELL-SAMPLE RECORD

HOTCHKISS NO. 2 WELL
ARKANSAS FUEL OIL COMPANY

Cattaraugus County, New York, Town of Randolph
Randolph Quadrangle: 2.14 miles north of 42° 05' N. Lat. and 1.46 miles east of 79° 00' W. Long.
Completed: 1930
Elevation: 1760 feet above sea level.
Total depth: 4484 feet.
Result: Abandoned as a dry hole at approximate base of Lockport dolomite on account of drilling difficulties.
Samples: 478 to 4484 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 3534+ feet	
	Upper Devonian Series, 2953+ feet	
	Conneaut group, 662+ feet	
478	No samples	0 - 478
16	Shale, greenish gray, with some interbedded dark reddish-brown sandy shale	478 - 494
8	Sandstone, fine to medium-grained, greenish gray, somewhat calcareous	494 - 502
40	Shale, greenish gray, sandy, with some interbedded dark reddish-brown sandy shale	502 - 542
8	Shale, greenish gray, sandy	542 - 550
8	Sandstone, fine-grained, light greenish gray	550 - 558
56	Shale, greenish gray, sandy	558 - 614
32	Shale, dark greenish gray	614 - 646
16	Sandstone, fine-grained, light greenish gray, sparingly fossiliferous, Glade sand	646 - 662

Thickness Feet	Description of Strata	Depth in feet
	Canadaway group, 1415 feet	
24	Shale, dark gray	662 - 686
8	Sandstone, very fine-grained, light greenish gray, fossiliferous	686 - 694
16	Shale, dark gray	694 - 710
8	Shale, dark gray, sandy	710 - 718
64	Sandstone, fine-grained, light gray, Clarendon sand	718 - 782
8	Shale, gray	782 - 790
8	Sandstone, fine-grained, light gray	790 - 798
32	Shale, light greenish gray, sandy	798 - 830
24	Sandstone, very fine-grained, light greenish gray, Gartland sand	830 - 854
186	Shale, gray, sparingly fossiliferous	854 - 1040
35	Sandstone, very fine-grained, light greenish gray	1040 - 1075
91	Shale, gray, sparingly fossiliferous	1075 - 1166
56	Shale, dark gray	1166 - 1222
84	Shale, gray, fossiliferous	1222 - 1306
28	Shale, dark gray	1306 - 1334
24	Shale, gray sandy	1334 - 1358
14	Shale, gray	1358 - 1372
7	Sandstone, very fine-grained, greenish gray, argillaceous, calcareous	1372 - 1379
98	Shale, gray to dark gray, with some interbedded thin layers of very fine-grained light gray somewhat calcareous sandstone	1379 - 1477
21	Shale, gray, sandy	1477 - 1498

Hotchkiss No. 2

Thickness Feet	Description of Strata	Depth in feet
21	Shale, gray, with some interbedded thin layers of very fine-grained light gray somewhat calcareous sandstone	1498 - 1519
7	Shale, gray, sandy	1519 - 1526
49	Shale, gray	1526 - 1575
7	Shale, greenish gray, sandy	1575 - 1582
28	Shale, gray	1582 - 1610
21	Shale, greenish gray, sandy	1610 - 1631
260	Shale, interbedded, gray, and greenish gray, sandy shale	1631 - 1891
49	Shale, very dark gray, almost black, with some interbedded light greenish gray sandy shale	1891 - 1940
78	Shale, gray, with some interbedded light gray sandy shale and very fine-grained sandstone	1940 - 2018
21	Shale, greenish gray, sandy	2018 - 2039
	Top of Dunkirk shale	2039
14	Shale, gray, with some interbedded grayish-black shale	2039 - 2053
7	Shale, grayish black	2053 - 2060
7	Shale, gray, in part calcareous	2060 - 2067
10	Shale, grayish black	2067 - 2077
	Bottom of Dunkirk shale and Canadaway group	2077
50	Shale, greenish gray, sandy, with some interbedded gray shale	2077 - 2127
10	Sandstone, very fine-grained, greenish gray	2127 - 2137
50	Shale, greenish gray, sandy, with some interbedded gray shale	2137 - 2187
80	Shale, gray, with some interbedded greenish-gray sandy shale	2187 - 2267

Hotchkiss No. 2

Thickness Feet	Description of Strata	Depth in feet
30	Shale, greenish gray, sandy	2267 - 2297
20	Shale, gray	2297 - 2317
10	Sandstone, very fine-grained, greenish gray, somewhat calcareous	2317 - 2327
57	Shale, greenish gray, sandy, with some interbedded black shale	2327 - 2384
14	Shale, gray	2384 - 2398
19	Shale, grayish black	2398 - 2417
37	Shale, gray, with some interbedded gray sandy shale	2417 - 2454
14	Shale, gray, with some interbedded black shale	2454 - 2468
7	Shale, black	2468 - 2475
105	Shale, gray, with some interbedded black shale	2475 - 2580
7	Shale, black	2580 - 2587
21	Shale, gray, with some interbedded black shale	2587 - 2608
19	Shale, black	2608 - 2627
28	Shale, very dark gray	2627 - 2655
28	Shale, very dark gray, with some interbedded black shale	2655 - 2683
7	Shale, black	2683 - 2690
7	Shale, very dark gray	2690 - 2697
31	Shale, black	2697 - 2728
140	Shale, dark gray, slightly calcareous and sparingly fossiliferous, with some interbedded black shale	2728 - 2868
43	Shale, grayish black	2868 - 2911
42	Shale, dark gray, with some interbedded thin layers of grayish-brown limestone	2911 - 2953

Hotchkiss No. 2

Thickness Feet	Description of Strata	Depth in feet
	Middle Devonian Series, 581 feet	
	Hamilton group, 427 feet	
7	Limestone, very fine, crystalline, grayish brown	2953 - 2960
42	Shale, dark gray, with some interbedded thin layers of grayish-brown limestone	2960 - 3002
7	Limestone, very fine, crystalline, dark grayish brown	3002 - 3009
42	Shale, dark gray, slightly calcareous, with some interbedded thin layers of grayish-brown limestone	3009 - 3051
49	Shale, very dark gray, slightly calcareous	3051 - 3100
98	Shale, brownish black, slightly calcareous	3100 - 3198
14	Shale, very dark gray, slightly calcareous	3198 - 3212
7	Shale, brownish black, somewhat calcareous	3212 - 3219
21	Shale, very dark gray, slightly calcareous	3219 - 3240
7	Shale, grayish black, slightly calcareous	3240 - 3247
7	Shale, very dark gray, slightly calcareous	3247 - 3254
77	Shale, black, slightly calcareous	3254 - 3331
21	Shale, very dark brownish gray, somewhat calcareous	3331 - 3352
7	Limestone, very fine, crystalline, dark brownish gray	3352 - 3359
7	Shale, very dark brownish gray, somewhat calcareous	3359 - 3366
14	Shale, black	3366 - 3380
	Onondaga limestone, 154 feet	
154	Limestone, very fine, crystalline, grayish brown, cherty	3380 - 3534

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 950+ feet	
	Upper Silurian or Cayugan Series, 676 feet	
	Cobleskill limestone, 9 feet	
9	Limestone, very fine, dark grayish brown, siliceous, magnesian	3534 - 3543
	Salina group, 667 feet	
45	Limestone, very fine, dark grayish brown, argillaceous, magnesian, Bertie	3543 - 3588
99	Limestone, very fine, dense, very dark brownish gray, argillaceous, magnesian, containing some anhydrite	3588 - 3687
46	Limestone, very fine, dense, dark grayish brown, argillaceous, magnesian, containing some anhydrite	3687 - 3733
90	Limestone, very fine, dense, brownish gray to dark brownish gray, argillaceous and siliceous, containing a little anhydrite	3733 - 3823
40	Limestone, very fine, dense, light brownish gray, argillaceous, magnesian, containing a little anhydrite	3823 - 3863
10	Limestone, very fine, dense, grayish brown, argillaceous	3863 - 3873
20	Shale, light bluish gray, interbedded with very fine, dense, grayish-brown argillaceous limestone; a few medium-sized well-rounded quartz grains occur at this horizon	3873 - 3893
30	Shale, bluish gray, interbedded with very fine, dense, brownish-gray argillaceous limestone containing a little salt and anhydrite	3893 - 3923
50	Shale, greenish gray, with a very little interbedded red shale; contains a little anhydrite	3923 - 3973
20	Shale, greenish gray, with considerable interbedded anhydrite	3973 - 3993

Hotchkiss No. 2

Thickness Feet	Description of Strata	Depth in feet
37	Shale, greenish and bluish gray, somewhat calcareous	3993 - 4030
40	Shale, gray to dark gray, somewhat calcareous	4030 - 4070
50	Limestone, very fine, dense, dark grayish brown, very argillaceous	4070 - 4120
20	Limestone, very fine, dense, dark grayish brown, argillaceous, containing a little salt	4120 - 4140
10	Limestone, very fine, dense, brownish gray, argillaceous, with some interbedded bluish-gray shale	4140 - 4150
30	Limestone, very fine, dense, brownish gray, argillaceous	4150 - 4180
30	Shale, dark greenish gray, interbedded with very fine, dense, brownish-gray argillaceous limestone	4180 - 4210
	Middle Silurian or Niagaran Series, 274+ feet	
	Lockport-Guelph dolomite, 274+ feet	
90	Limestone, very fine, dense, dark brownish gray, argillaceous, dolomitic	4210 - 4300
184	Limestone, very fine, crystalline, dark grayish brown, dolomitic	4300 - 4484
	TOTAL DEPTH	4484

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

RYDER-SCOTT NO. 1 WELL
J. BROOKE REED ET AL.

Cattaraugus County, New York, Town of Allegany
Salamanca Quadrangle: 1.16 miles north of 42° 00' N. Lat. and 1.59 miles west of 78° 30' W. Long.
Completed: 1934.
Elevation: 1876 feet above sea level.
Total depth: 4370 feet.
Deepest formation: Oriskany
Result: Salt water, 783-793 feet in Bradford First sand; show of gas and oil, 1419-1510 feet in Bradford Third sand; gas pocket, 4304-4306 feet in Onondaga limestone; dry in Oriskany.
Samples: 15 to 4370 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4370+ feet	
	Upper Devonian Series, 3781+ feet	
	Cattaraugus formation, 105+ feet	
15	No samples	0 - 15
49	Sandstone, fine-grained, grayish green, with some interbedded brick-red sandy shale in lower part	15 - 64
14	Shale, greenish gray, sandy	64 - 78
16	Shale, greenish gray	78 - 94
5	Shale, greenish gray, sandy	94 - 99
6	Sandstone, medium to coarse-grained, light greenish gray, with some well rounded quartz grains up to 2 mm. in diameter; Wolf Creek	99 - 105
	Conneaut group, 688 feet	
16	Shale, greenish gray, sandy	105 - 121
28	Shale, greenish gray, fossiliferous in lower part	121 - 149

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Shale, greenish gray, sandy	149 - 174
11	Shale, greenish gray, fossiliferous, with some interbedded purplish-gray sandy shale	174 - 185
35	Shale, greenish gray, sandy	185 - 220
10	Shale, greenish gray	220 - 230
11	Shale, dark greenish gray, sandy	230 - 241
5	Shale, greenish gray	241 - 246
6	Shale, greenish gray, sandy	246 - 252
12	Shale, dark greenish gray, with some interbedded grayish-green sandy shale	252 - 264
6	Shale, greenish gray, sandy	264 - 270
12	Shale, greenish gray, sandy, with some interbedded purplish-gray sandy shale	270 - 282
23	Shale, greenish gray, sandy, fossiliferous	282 - 305
6	Sandstone, very fine-grained, dark greenish gray, with some interbedded dark greenish-gray shale	305 - 311
6	Shale, dark greenish gray, fossiliferous, with some interbedded dark purplish-gray sandy shale	311 - 317
16	Shale, greenish gray, sandy, fossiliferous	317 - 333
16	Shale, grayish purple, sandy	333 - 349
5	Shale, greenish gray, sandy, fossiliferous, with some interbedded grayish-purple sandy shale	349 - 354
5	Shale, dark greenish gray, sandy	354 - 359
16	Shale, greenish gray	359 - 375
10	Sandstone, very fine-grained, light greenish gray, very fossiliferous	375 - 385
23	Shale, grayish purple, in part sandy, with some interbedded greenish-gray shale	385 - 408

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Shale, greenish gray, sandy	408 - 413
55	Shale, grayish purple, sandy, with some interbedded greenish-gray shale	413 - 468
18	Sandstone, very fine-grained, light greenish gray, fossiliferous, with some interbedded greenish-gray and purplish-gray shale	468 - 486
48	Shale, greenish gray	486 - 534
6	Shale, greenish gray, sandy	534 - 540
6	Shale, dark greenish gray	540 - 546
6	Shale, greenish gray, sandy, fossiliferous	546 - 552
11	Shale, greenish gray, with some interbedded greenish-gray sandy shale	552 - 563
20	Shale, dark greenish gray, with some interbedded greenish-gray sandy shale	563 - 583
5	Sandstone, very fine-grained, greenish gray, fossiliferous	583 - 588
15	Shale, dark greenish gray	588 - 603
2	Sandstone, very fine-grained, greenish gray, fossiliferous	603 - 605
23	Shale, dark greenish gray, with some interbedded dark greenish-gray sandy shale, fossiliferous	605 - 628
3	Sandstone, fine-grained, reddish brown, ferruginous, slightly calcareous	628 - 631
20	Shale, interbedded dark greenish gray, and sandy shale	631 - 651
10	Shale, greenish gray	651 - 661
10	Shale, dark greenish gray, sandy, fossiliferous	661 - 671
12	Shale, dark greenish gray, with some interbedded greenish-gray sandy shale	671 - 683
12	Shale, greenish gray, sandy, very fossiliferous	683 - 695

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, greenish gray	695 - 703
8	Shale, greenish gray, sandy, very fossiliferous	703 - 711
4	Sandstone, very fine-grained, light greenish gray, very fossiliferous	711 - 715
18	Shale, dark greenish gray	715 - 733
18	Sandstone, very fine-grained, light greenish gray, somewhat calcareous in lower part, with some interbedded greenish-gray shale	733 - 751
15	Shale, greenish gray to dark gray	751 - 766
5	Shale, dark greenish gray, sandy	766 - 771
12	Shale, dark gray	771 - 783
10	Sandstone, medium to coarse-grained, white, with quartz grains up to 2 mm. in diameter, somewhat calcareous in upper part; SALT WATER encountered in this sand; Bradford First sand	783 - 793
	Canadaway group, 1401 feet	
26	Shale, greenish gray, sandy	793 - 819
17	Shale, greenish gray	819 - 836
10	Shale, greenish gray, sandy	836 - 846
9	Sandstone, very fine-grained, pale grayish brown, fossiliferous, with some interbedded greenish-gray shale	846 - 855
8	Sandstone, fine-grained, light gray, fossiliferous, with some interbedded greenish-gray shale; Watsonville sand	855 - 863
8	Shale, greenish gray	863 - 871
8	Sandstone, fine-grained, light greenish gray, with some interbedded greenish-gray shale	871 - 879
48	Shale, greenish gray, with some interbedded greenish-gray sandy shale	879 - 927

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Sandstone, fine-grained, light gray, slightly calcareous	927 - 934
12	Shale, gray, with some interbedded fine-grained light gray sandstone, slightly calcareous	934 - 946
51	Shale, greenish gray	946 - 997
	Top of Chipmunk sand	997
4	Sandstone, fine-grained, light grayish brown	997 - 1001
5	Shale, dark greenish gray	1001 - 1006
38	Sandstone, fine-grained, light grayish brown, with a little interbedded gray shale	1006 - 1044
	Bottom of Chipmunk sand	1044
81	Shale, greenish gray, in part sandy	1044 - 1125
	Top of Bradford Second sand	1125
4	Sandstone, fine-grained, chocolate brown	1125 - 1129
7	Shale, greenish gray	1129 - 1136
6	Shale, greenish gray, sandy, with a little interbedded fine-grained light greenish gray sandstone	1136 - 1142
14	Sandstone, very fine-grained, chocolate brown, slightly calcareous, with some interbedded greenish-gray shale	1142 - 1156
	Bottom of Bradford Second sand	1156
35	Shale, greenish gray, with some interbedded very fossiliferous greenish-gray sandy shale in lower part	1156 - 1191
9	Sandstone, very fine-grained, grayish brown, somewhat calcareous; Harrisburg Run sand	1191 - 1200
33	Shale, greenish gray	1200 - 1233
31	Shale, greenish gray, sandy, interbedded with greenish gray shale, fossiliferous	1233 - 1264

Thickness Feet	Description of Strata	Depth in feet
41	Shale, greenish gray	1264 - 1305
8	Shale, greenish gray, sandy	1305 - 1313
70	Shale, greenish gray	1313 - 1383
20	Shale, greenish gray, sandy, fossiliferous	1383 - 1403
16	Shale, greenish gray	1403 - 1419
91	Sandstone, very fine-grained, grayish brown, interbedded with greenish-gray shale, show of GAS and OIL; Bradford Third sand	1419 - 1510
105	Shale, greenish gray, with a little interbedded very fine-grained grayish-brown and light greenish-gray sandstone	1510 - 1615
73	Shale, greenish gray, with some interbedded greenish-gray sandy shale	1615 - 1688
8	Sandstone, very fine-grained, brown, slightly calcareous, with a great deal of interbedded greenish-gray shale; Kane sand	1688 - 1696
21	Shale, gray, sandy	1696 - 1717
38	Shale, gray	1717 - 1755
36	Shale, gray to dark gray, sandy	1755 - 1791
8	Shale, dark brownish gray, sandy	1791 - 1799
42	Shale, gray to dark gray	1799 - 1841
27	Shale, greenish gray, with some interbedded greenish-gray sandy shale, fossiliferous	1841 - 1868
41	Shale, gray	1868 - 1909
9	Shale, gray, sandy	1909 - 1918
8	Shale, gray	1918 - 1926
12	Sandstone, very fine-grained, light greenish gray, with a little interbedded gray shale; Humphrey sand	1926 - 1938
25	Shale, gray to very dark gray	1938 - 1963

Thickness Feet	Description of Strata	Depth in feet
15	Shale, greenish to dark greenish gray, sandy	1963 - 1978
25	Shale, gray, with a little interbedded very dark gray shale	1978 - 2003
9	Shale, very dark gray	2003 - 2012
19	Shale, gray	2012 - 2031
17	Shale, very dark gray, sandy	2031 - 2048
17	Shale, gray	2048 - 2065
9	Shale, gray, sandy	2065 - 2074
9	Shale, gray, with a little interbedded very fine-grained light gray sandstone	2074 - 2083
8	Shale, gray, sandy	2083 - 2091
	Dunkirk shale member, 103 feet	
7	Shale, gray with some interbedded grayish black shale	2091 - 2098
27	Shale, gray, sandy, with some interbedded gray shale	2098 - 2125
15	Shale, gray, with some interbedded dark gray shale	2125 - 2140
20	Shale, gray to very dark gray, sandy	2140 - 2160
8	Shale, gray	2160 - 2168
20	Shale, grayish black, with some interbedded gray sandy shale	2168 - 2188
6	Shale, gray, with a little interbedded grayish-black shale	2188 - 2194
	Bottom of Canadaway group	2194
9	Shale, dark gray, sandy, with some interbedded gray shale	2194 - 2203
43	Shale, greenish gray, sandy, with a little interbedded very dark gray shale	2203 - 2246
9	Shale, greenish gray, sandy, with some interbedded grayish-black shale	2246 - 2255

Thickness Feet	Description of Strata	Depth in feet
32	Shale, greenish gray, sandy	2255 - 2287
51	Shale, gray, with a little interbedded gray to dark gray sandy shale	2287 - 2338
11	Shale, very dark gray, almost black	2338 - 2349
5	Sandstone, very fine-grained, light gray, with considerable interbedded grayish-black shale	2349 - 2354
9	Shale, dark gray, sandy, with a little very fine-grained gray sandstone, somewhat calcareous	2354 - 2363
14	Shale, dark gray to very dark gray, almost black, with some interbedded gray sandy shale	2363 - 2377
7	Shale, black, with a little interbedded very fine-grained, light greenish-gray sandstone, slightly calcareous	2377 - 2384
9	Shale, light greenish gray, sandy	2384 - 2393
5	Sandstone, very fine-grained, greenish gray, slightly calcareous	2393 - 2398
29	Shale, greenish gray, sandy	2398 - 2427
7	Sandstone, very fine-grained, greenish gray, slightly calcareous	2427 - 2434
4	Shale, gray	2434 - 2438
15	Shale, greenish gray, sandy, with some interbedded gray shale	2438 - 2453
5	Shale, dark greenish gray	2453 - 2458
10	Shale, gray	2458 - 2468
7	Sandstone, very fine-grained, greenish gray, slightly calcareous, with some interbedded dark gray shale	2468 - 2475
8	Shale, gray	2475 - 2483
9	Shale, greenish gray, sandy	2483 - 2492
9	Sandstone, very fine-grained, light greenish gray	2492 - 2501

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish gray, sandy	2501 - 2519
9	Shale, gray	2519 - 2528
24	Sandstone, very fine-grained, light greenish gray, with some interbedded grayish-black shale	2528 - 2552
7	Shale, greenish gray, sandy	2552 - 2559
28	Shale, gray to dark gray, sandy	2559 - 2587
8	Shale, gray	2587 - 2595
55	Shale, greenish gray, sandy	2595 - 2650
80	Shale, dark gray	2650 - 2730
8	Shale, greenish gray, sandy	2730 - 2738
8	Shale, dark gray	2738 - 2746
17	Shale, greenish gray, sandy, small show of GAS	2746 - 2763
11	Shale, dark gray, with a little interbedded grayish-black shale	2763 - 2774
6	Shale, greenish gray, sandy	2774 - 2780
15	Shale, dark gray, with some interbedded dark greenish-gray sandy shale	2780 - 2795
7	Sandstone, very fine-grained, greenish gray	2795 - 2802
10	Shale, gray	2802 - 2812
23	Shale, greenish to dark greenish gray	2812 - 2835
50	Shale, gray	2835 - 2885
9	Shale, gray, with some interbedded grayish-black shale	2885 - 2894
45	Shale, gray to very dark gray	2894 - 2939
13	Sandstone, very fine-grained, brownish gray, slightly calcareous	2939 - 2952

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Shale, dark gray	2952 - 2963
5	Sandstone, very fine-grained, gray	2963 - 2968
10	Sandstone, very fine-grained, brownish gray	2968 - 2978
56	Shale, dark gray, with a little interbedded very fine-grained gray sandstone	2978 - 3034
14	Shale, dark gray, with some interbedded grayish-black shale	3034 - 3048
30	Shale, dark gray, with a little interbedded very fine-grained gray sandstone	3048 - 3078
32	Shale, grayish black	3078 - 3110
63	Shale, gray to dark gray	3110 - 3173
20	Shale, grayish black	3173 - 3193
11	Shale, gray to dark gray	3193 - 3204
5	Shale, grayish black	3204 - 3209
20	Shale, dark gray	3209 - 3229
40	Shale, grayish black, with a little interbedded dark gray shale	3229 - 3269
34	Shale, gray to dark gray	3269 - 3303
18	Shale, grayish black, with some interbedded gray shale	3303 - 3321
74	Shale, dark gray	3321 - 3395
121	Shale, dark gray, slightly calcareous	3395 - 3516
26	Shale, very dark gray, slightly calcareous	3516 - 3542
5	Shale, grayish black	3542 - 3547
10	Shale, very dark gray	3547 - 3557
101	Shale, grayish black	3557 - 3658
29	Shale, very dark gray, slightly calcareous	3658 - 3687

Ryder-Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Shale, very dark gray, almost black, somewhat calcareous	3687 - 3704
34	Shale, black, calcareous	3704 - 3738
12	Shale, black, slightly calcareous	3738 - 3750
13	Shale, grayish black	3750 - 3763
18	Shale, black, slightly calcareous	3763 - 3781
	Middle Devonian Series, 572 feet	
	Tully limestone, 4 feet	
4	Limestone, very fine, dense, grayish brown	3781 - 3785
	Hamilton group, 490 feet	
36	Shale, very dark gray, somewhat calcareous	3785 - 3821
18	Shale, dark to very dark gray, slightly calcareous	3821 - 3839
2	Limestone, very fine, dense, light brownish gray, very fossiliferous	3839 - 3841
51	Shale, very dark gray, somewhat calcareous	3841 - 3892
24	Shale, very dark gray, calcareous	3892 - 3916
3	Limestone, very fine, dense, grayish brown	3916 - 3919
23	Shale, dark to very dark gray, calcareous	3919 - 3942
20	Shale, dark to very dark gray, somewhat calcareous	3942 - 3962
6	Shale, very dark gray, calcareous	3962 - 3968
27	Shale, grayish black, somewhat calcareous	3968 - 3995
6	Shale, grayish black, calcareous	3995 - 4001
41	Shale, very dark gray, somewhat calcareous	4001 - 4042
39	Shale, grayish black, somewhat calcareous	4042 - 4081

Ryder Scott No. 1

Thickness Feet	Description of Strata	Depth in feet
2	Limestone, very fine, dense, grayish brown	4081 - 4083
60	Shale, grayish black, somewhat calcareous	4083 - 4143
19	Shale, dark gray, somewhat calcareous	4143 - 4162
15	Shale, very dark gray, calcareous	4162 - 4177
19	Shale, dark to very dark gray, somewhat calcareous	4177 - 4196
35	Shale, black, calcareous	4196 - 4231
22	Shale, black, somewhat calcareous	4231 - 4253
1	Limestone, very fine, dense, grayish brown	4253 - 4254
15	Shale, black	4254 - 4269
6	Shale, black, calcareous	4269 - 4275
	Onondaga limestone, 78 feet	
8	Limestone, very fine, crystalline, dark grayish brown	4275 - 4283
57	Limestone, very fine, dense, very dark grayish brown, GAS pocket at 4304-4306	4283 - 4340
13	Limestone, very fine, crystalline, light brownish gray, cherty	4340 - 4353
	Lower Devonian Series, 17+ feet	
	Oriskany sandstone, 17+ feet	
7	Sandstone, medium-grained, light gray, calcareous	4353 - 4360
3	Sandstone, medium-grained, light gray, slightly calcareous	4360 - 4363
7	Sandstone, medium-grained, light gray, somewhat calcareous	4363 - 4370
	TOTAL DEPTH	4370

WELL-SAMPLE RECORD

NO.

33

WELL-SAMPLE RECORD

QUINLAN NO. 1 WELL
J. BROOKE REED ET AL.

Cattaraugus County, New York, Town of Olean
Olean Quadrangle: .96 mile north of 42° 00' N. Lat. and 1.74 miles west of 78° 25' W. Long.
Completed: 1933.
Elevation: 1686 feet above sea level.
Total depth: 4296 feet.
Deepest formation: Helderberg.
Result: Gas and oil, 1140-1258 feet in Bradford Third sand; good show of oil, 1470-1493 in Kane sand; small show of oil, 1968-1980 in Dunkirk sandstone; good show of oil, 4276-4281 in Oriskany sandstone.
Samples: 30 to 4296 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4296+ feet	
	Upper Devonian Series, 3743+ feet	
	Conneaut group, 512+ feet	
30	No samples	0 - 30
32	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale in lower part	30 - 62
27	Shale, greenish gray, sandy, with some interbedded very fine-grained greenish-gray sandstone	62 - 89
2	Sandstone, very fine-grained, brownish gray	89 - 91
18	Shale, greenish gray, sandy	91 - 109
19	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale	109 - 128

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
26	Shale, greenish gray, sandy, fossiliferous, with some interbedded very fine-grained greenish-gray sandy shale	128 - 154
17	Sandstone, very fine-grained, greenish gray, slightly calcareous, with some interbedded greenish-gray sandy shale	154 - 171
23	Sandstone, very fine-grained, grayish-brown, with some interbedded greenish-gray sandy shale	171 - 194
12	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale	194 - 206
5	Shale, greenish gray, sandy	206 - 211
6	Sandstone, very fine-grained, greenish gray	211 - 217
6	Sandstone, very fine-grained, brown	217 - 223
5	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale	223 - 228
12	Shale, greenish gray, sandy, with some very fine-grained light brownish-gray and greenish-gray sandstone	228 - 240
12	Sandstone, very fine-grained, greenish gray, slightly calcareous, with some interbedded greenish-gray sandy shale	240 - 252
6	Shale, greenish gray, sandy	252 - 258
11	Sandstone, very fine-grained, dark grayish brown, with a little interbedded greenish-gray sandy shale	258 - 269
11	Sandstone, very fine-grained, greenish gray, with a little interbedded greenish-gray sandy shale	269 - 280
6	Sandstone, very fine-grained, dark grayish brown, with some interbedded dark greenish-gray sandy shale	280 - 286
16	Shale, gray, sandy, fossiliferous	286 - 302

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine-grained, greenish gray, with some interbedded gray shale	302 - 307
47	Shale, greenish gray, sandy	307 - 354
18	Sandstone, very fine-grained, greenish gray, with some interbedded greenish-gray sandy shale	354 - 372
5	Shale, gray	372 - 377
58	Shale, greenish gray, sandy	377 - 435
6	Sandstone, very fine-grained, greenish gray	435 - 441
6	Shale, greenish gray, sandy	441 - 447
6	Shale, gray	447 - 453
6	Shale, greenish gray, sandy	453 - 459
5	Shale, greenish gray	459 - 464
12	Shale, greenish gray, sandy, very fossiliferous in upper part	464 - 476
5	Shale, greenish gray	476 - 481
25	Shale, greenish gray, sandy, fossiliferous	481 - 506
6	Sandstone, fine-grained, greenish gray, slightly calcareous; Bradford First sand	506 - 512
	Canadaway group, 1468 feet	
12	Shale, greenish gray, sandy	512 - 524
12	Shale, greenish gray	524 - 536
14	Shale, greenish gray, sandy	536 - 550
4	Sandstone, very fine-grained, light greenish gray, somewhat calcareous, fossiliferous	550 - 554
16	Shale, gray	554 - 570
6	Shale, dark greenish gray, sandy, fossiliferous	570 - 576

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, gray	576 - 594
9	Sandstone, fine-grained, light gray; Watsonville sand	594 - 603
15	Shale, gray	603 - 618
6	Shale, greenish gray, sandy	618 - 624
19	Shale, greenish gray	624 - 643
7	Shale, greenish gray, sandy, with some interbedded very fine-grained brownish and greenish-gray sandstone	643 - 650
24	Shale, gray	650 - 674
6	Sandstone, very fine-grained, greenish gray	674 - 680
13	Shale, gray, in part sandy	680 - 693
12	Sandstone, fine-grained, light brownish gray, somewhat calcareous in upper part; Chipmunk sand	693 - 705
31	Shale, greenish gray, with some interbedded very fine-grained light brownish and greenish-gray sandstone	705 - 736
48	Shale, greenish gray	736 - 784
6	Shale, greenish gray, sandy, fossiliferous	784 - 790
6	Sandstone, very fine-grained, greenish gray, slightly calcareous, with some interbedded greenish-gray shale	790 - 796
47	Shale, gray	796 - 843
	Top of Bradford Second sand	843
5	Sandstone, very fine-grained, light brownish gray, slightly calcareous	843 - 848
17	Sandstone, very fine-grained, grayish brown, slightly calcareous, with a little interbedded greenish-gray shale	848 - 865
18	Sandstone, very fine grained, grayish brown, with a little interbedded gray shale	865 - 883

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine-grained, grayish brown and greenish gray	883 - 889
6	Sandstone, very fine-grained, brownish gray with some interbedded gray sandy shale	889 - 895
10	Sandstone, very fine-grained, brownish gray, slightly calcareous, with a little interbedded gray shale	895 - 905
	Bottom of Bradford Second sand	905
6	Shale, gray, sandy	905 - 911
10	Shale, gray and greenish gray	911 - 921
37	Shale, gray, sandy	921 - 958
3	Sandstone, very fine-grained, grayish brown, slightly calcareous; Harrisburg Run sand	958 - 961
28	Shale, gray, sandy	961 - 989
7	Shale, gray	989 - 996
7	Shale, gray, sandy	996 - 1003
11	Shale, gray	1003 - 1014
26	Shale, gray, sandy, fossiliferous in upper part	1014 - 1040
7	Shale, gray	1040 - 1047
12	Shale, gray, sandy	1047 - 1059
31	Shale, gray	1059 - 1090
8	Shale, greenish gray, sandy, fossiliferous	1090 - 1098
40	Shale, gray	1098 - 1138
2	Sandstone, very fine-grained, light gray, calcareous, very fossiliferous	1138 - 1140
	Top of Bradford Third sand	1140
17	Sandstone, fine-grained, light grayish brown, GAS PAY, with a little interbedded greenish-gray shale	1140 - 1157

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
28	Sandstone, fine-grained, light brownish gray; GAS PAY	1157 - 1185
6	Sandstone, fine-grained, grayish brown, OIL PAY, with some interbedded greenish-gray shale	1185 - 1191
8	Sandstone, fine-grained, grayish brown, OIL PAY	1191 - 1199
10	Sandstone, fine-grained, grayish brown, OIL PAY, with considerable interbedded greenish-gray shale	1199 - 1209
49	Sandstone, fine-grained, grayish brown, OIL PAY, with some interbedded greenish-gray shale	1209 - 1258
	Bottom of Bradford Third sand	1258
8	Shale, greenish gray, with a little interbedded grayish-brown sandstone	1258 - 1266
15	Shale, gray	1266 - 1281
18	Shale, gray, with a little interbedded grayish-brown sandstone	1281 - 1299
6	Shale, gray	1299 - 1305
40	Shale, gray, with a little interbedded very fine-grained light gray sandstone	1305 - 1345
79	Shale, gray	1345 - 1424
	Top of Kane sand	1424
10	Sandstone, very fine-grained, chocolate brown	1424 - 1434
36	Shale, gray	1434 - 1470
16	Sandstone, very fine-grained, grayish brown, slightly calcareous, good show of OIL, with some interbedded gray shale	1470 - 1486
7	Sandstone, very fine-grained, dark grayish brown, good show of OIL	1486 - 1493
	Bottom of Kane sand	1493

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
21	Shale, gray, sandy	1493 - 1514
29	Shale, dark gray, sandy	1514 - 1543
13	Shale, gray	1543 - 1556
13	Shale, gray, sandy	1556 - 1569
14	Shale, gray	1569 - 1583
6	Shale, dark gray, sandy	1583 - 1589
61	Shale, gray	1589 - 1650
8	Shale, gray, sandy	1650 - 1658
34	Shale, gray and dark gray	1658 - 1692
11	Shale, gray, sandy	1692 - 1703
	Top of Humphrey sand	1703
3	Sandstone, very fine-grained, chocolate brown	1703 - 1706
11	Shale, gray, sandy	1706 - 1717
11	Sandstone, very fine-grained, light greenish gray, slightly calcareous, show of OIL, with some interbedded gray shale	1717 - 1728
	Bottom of Humphrey sand	1728
8	Shale, gray	1728 - 1736
6	Shale, gray, sandy	1736 - 1742
27	Shale, gray	1742 - 1769
28	Shale, very dark gray, almost black, sandy, with some interbedded gray shale	1769 - 1797
8	Shale, greenish gray, sandy	1797 - 1805
8	Shale, very dark gray, sandy	1805 - 1813
23	Shale, greenish gray, sandy	1813 - 1836
8	Sandstone, very fine-grained, chocolate brown	1836 - 1844

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Shale, gray	1844 - 1859
3	Sandstone, very fine-grained, grayish brown	1859 - 1862
24	Shale, gray, in part sandy	1862 - 1886
17	Shale, dark to very dark gray, sandy	1886 - 1903
	Dunkirk shale member, 77 feet	
24	Shale, greenish gray, sandy, with some interbedded grayish-black sandy shale	1903 - 1927
8	Shale, grayish black, sandy, with some interbedded gray shale	1927 - 1935
8	Shale, gray	1935 - 1943
17	Shale, gray to dark gray, sandy	1943 - 1960
8	Shale, dark gray	1960 - 1968
12	Sandstone, very fine-grained, greenish gray, small show of OIL	1968 - 1980
	Bottom of Canadaway group	1980
27	Shale, greenish gray, sandy	1980 - 2007
8	Shale, very dark gray, almost black	2007 - 2015
47	Shale, dark gray, sandy	2015 - 2062
17	Shale, dark gray	2062 - 2079
52	Shale, greenish gray, with some interbedded grayish-black shale in lower part	2079 - 2131
15	Shale, gray	2131 - 2146
7	Shale, grayish black	2146 - 2153
19	Shale, greenish gray, sandy	2153 - 2172
40	Sandstone, very fine-grained, greenish gray, with some interbedded gray shale	2172 - 2212
11	Shale, greenish gray, with some interbedded very fine-grained brownish-gray sandstone	2212 - 2223

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
27	Shale, greenish gray, sandy	2223 - 2250
50	Sandstone, very fine-grained, brownish gray, with some interbedded gray shale	2250 - 2300
8	Sandstone, very fine-grained, greenish gray	2300 - 2308
6	Shale, dark gray, sandy	2308 - 2314
12	Sandstone, very fine-grained, greenish gray	2314 - 2326
6	Shale, dark gray, sandy	2326 - 2332
6	Sandstone, very fine-grained, light greenish gray	2332 - 2338
32	Shale, dark gray, with a little interbedded greenish-gray sandy shale	2338 - 2370
6	Shale, greenish gray, sandy	2370 - 2376
6	Sandstone, very fine-grained, greenish gray	2376 - 2382
6	Shale, dark greenish gray, sandy	2382 - 2388
116	Shale, dark gray	2388 - 2504
6	Shale, dark greenish gray, sandy	2504 - 2510
23	Shale, dark gray	2510 - 2533
5	Shale, brownish gray, sandy	2533 - 2538
18	Shale, gray, sandy	2538 - 2556
17	Shale, gray	2556 - 2573
39	Shale, gray, sandy	2573 - 2612
20	Shale, gray	2612 - 2632
12	Shale, gray, sandy	2632 - 2644
13	Shale, gray	2644 - 2657
9	Shale, gray, sandy	2657 - 2666
8	Shale, gray	2666 - 2674

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, gray, sandy	2674 - 2684
35	Shale, gray	2684 - 2719
12	Sandstone, very fine-grained, gray	2719 - 2731
6	Shale, gray	2731 - 2737
4	Shale, gray, sandy	2737 - 2741
7	Shale, gray	2741 - 2748
5	Sandstone, very fine-grained, gray, with some interbedded gray shale	2748 - 2753
14	Sandstone, very fine-grained, brownish gray to dark grayish brown, with some interbedded gray shale	2753 - 2767
5	Shale, gray	2767 - 2772
5	Sandstone, very fine-grained, gray	2772 - 2777
5	Shale, gray	2777 - 2782
12	Shale, gray, sandy	2782 - 2794
6	Shale, gray	2794 - 2800
12	Sandstone, very fine-grained, chocolate brown	2800 - 2812
20	Shale, gray	2812 - 2832
9	Shale, gray, sandy	2832 - 2841
10	Sandstone, very fine-grained, chocolate brown, with some interbedded gray shale	2841 - 2851
46	Shale, gray to dark gray	2851 - 2897
29	Shale, grayish black	2897 - 2926
10	Shale, gray, sandy	2926 - 2936
10	Shale, gray to dark gray	2936 - 2946
15	Shale, gray, sandy	2946 - 2961
31	Shale, gray to very dark gray	2961 - 2992

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Shale, dark gray, sandy	2992 - 3017
9	Shale, grayish black	3017 - 3026
11	Shale, gray, sandy	3026 - 3037
45	Shale, gray to very dark gray	3037 - 3082
53	Shale, gray, with a little interbedded grayish-black shale	3082 - 3135
19	Shale, grayish black, with some interbedded gray shale	3135 - 3154
29	Shale, gray to very dark gray	3154 - 3183
81	Shale, gray with a little interbedded grayish-black shale	3183 - 3264
10	Shale, grayish black	3264 - 3274
106	Shale, dark gray	3274 - 3380
76	Shale, gray, slightly calcareous	3380 - 3456
13	Shale, dark gray	3456 - 3469
7	Shale, grayish black	3469 - 3476
12	Shale, gray, with some interbedded grayish-black shale	3476 - 3488
54	Shale, very dark gray	3488 - 3542
8	Shale, grayish black	3542 - 3550
8	Shale, very dark gray	3550 - 3558
17	Shale, grayish black	3558 - 3575
41	Shale, dark gray	3575 - 3616
2	Limestone, very fine, dense, dark grayish brown; Genundewa	3616 - 3618
7	Shale, dark gray, slightly calcareous	3618 - 3625
16	Shale, very dark gray, slightly calcareous	3625 - 3641

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Shale, very dark brownish gray, calcareous	3641 - 3648
13	Shale, very dark gray, somewhat calcareous	3648 - 3661
10	Shale, very dark gray, calcareous	3661 - 3671
14	Shale, very dark gray, somewhat calcareous	3671 - 3685
14	Shale, dark gray	3685 - 3699
15	Shale, grayish black	3699 - 3714
12	Shale, gray	3714 - 3726
17	Shale, grayish black	3726 - 3743
	Middle Devonian Series, 533 feet	
	Tully limestone, 5 feet	
5	Limestone, very fine, dense, brownish gray	3743 - 3748
	Hamilton group, 427 feet	
51	Shale, dark gray, slightly calcareous	3748 - 3799
1	Limestone, very fine, dense, brownish gray	3799 - 3800
35	Shale, dark gray, somewhat calcareous	3800 - 3835
25	Shale, dark gray, slightly calcareous	3835 - 3860
42	Shale, dark gray, somewhat calcareous	3860 - 3902
21	Shale, dark gray, calcareous	3902 - 3923
29	Shale, dark gray, somewhat calcareous	3923 - 3952
14	Shale, dark gray, slightly calcareous	3952 - 3966
28	Shale, dark gray, somewhat calcareous	3966 - 3994
22	Shale, very dark gray, somewhat calcareous	3994 - 4016
84	Shale, dark gray, somewhat calcareous	4016 - 4100
17	Shale, grayish black, somewhat calcareous	4100 - 4117

Quinlan No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Shale, very dark gray, somewhat calcareous	4117 - 4142
33	Shale, black, somewhat calcareous	4142 - 4175
	Onondaga limestone, 101 feet	
6	Limestone, very fine, crystalline, brownish gray,	4175 - 4181
40	Limestone, fine, crystalline, very light brownish gray	4181 - 4221
39	Limestone, fine, crystalline, white, containing a little chert	4221 - 4260
10	Limestone, fine, crystalline, very light brownish gray, cherty	4260 - 4270
6	Limestone, very fine, dense, brownish gray, cherty, fossiliferous	4270 - 4276
	Lower Devonian Series, 20+ feet	
	Oriskany sandstone, 15 feet	
5	Sandstone, fine to medium-grained, dark grayish brown, somewhat calcareous; good show of OIL	4276 - 4281
7	Sandstone, fine to medium-grained, light gray, somewhat calcareous	4281 - 4288
3	Sandstone, fine to medium-grained, light gray; some of grains rounded and frosted, others show crystal facets, somewhat calcareous; good show of OIL	4288 - 4291
	Helderberg group, 5+ feet	
5	Limestone, very fine, crystalline, dark grayish brown	4291 - 4296
	TOTAL DEPTH	4296

WELL-SAMPLE RECORD

NO.

34

WELL-SAMPLE RECORD

ARCADE NO. 1 WELL
K. R. WILSON

Wyoming County, New York, Town of Arcade
Arcade Quadrangle: 2.11 miles north of 42° 30' N. Lat. and .35 mile west of 78° 25' W. Long.
Completed: August 21, 1946.
Elevation: 1483 feet above sea level.
Total depth: 7144 feet.
Deepest formation: Potsdam sandstone.
Result: Black salt water at 3005 feet in Lockport; show of oil and a little gas at 5994 feet and show of gas at 6030 feet in Middle Ordovician; 25,000 cubic feet of gas at 6182 feet in Tribes Hill; salt water at 6375-6395 in Theresa; considerable salt water at 7040 feet in Potsdam, rose 5500 feet.
Samples: 1750 to 2291 feet and 3235 to 7144 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 2291+ feet	
	Upper Devonian Series, 1750+ feet	
1750	No samples	0 - 1750
	Middle Devonian Series, 541 feet	
	Hamilton group, 395 feet	
10	Limestone, very fine, dense, brownish-gray, argillaceous, with considerable interbedded grayish-black slightly calcareous shale	1750 - 1760
9	Shale, gray to dark-gray, somewhat calcareous, containing fragments of shells	1760 - 1769
27	No samples	1769 - 1796
5	Limestone, very fine, dense, light brownish- to brownish-gray, argillaceous and fossiliferous, containing considerable light brownish-gray chert	1796 - 1801
154	No samples	1801 - 1955

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, dark-gray, somewhat calcareous, with some interbedded very fine, dense, brownish-gray argillaceous and fossiliferous limestone	1955 - 1965
180	No samples	1965 - 2145
	Onondaga limestone, 146 feet	
13	Limestone, very fine, dense, brownish-gray, slightly argillaceous, containing considerable brownish- to dark brownish-gray chert	2145 - 2158
118	No samples	2158 - 2276
10	Limestone, very fine, dense, light brownish-gray, containing a great deal of light brownish-gray chert	2276 - 2286
5	Limestone, very fine, dense, brownish-gray, somewhat argillaceous, containing considerable light brownish-gray chert	2286 - 2291
944	No samples	2291 - 3235
	From drillers' log	
	SILURIAN SYSTEM, 1067 feet	
	Upper Silurian or Cayugan Series, 634 feet	
	A little salt	2500
160	Shale and salt	2600 - 2760
17	Pure salt	2760 - 2777
	Middle Silurian or Niagaran Series, 310 feet	
	Lockport dolomite, 219 feet	
219	Limestone, containing black SALT WATER at 3005 feet	2925 - 3144
	From sample studies	
	Lower Silurian or Albion Series, 123 feet	
	Grimsby formation, 108 feet	
14	Sandstone, very fine grained, light-gray, with considerable interbedded greenish-gray shale and some brick-red silty shale containing some muscovite	3235 - 3249

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, very fine grained, brownish-red, with considerable interbedded greenish-gray shale	3249 - 3253
18	Shale, greenish-gray, with considerable interbedded brick-red shale and some very fine grained light-gray sandstone	3253 - 3271
6	Shale, greenish-gray, with considerable interbedded very fine grained reddish-brown sandstone	3271 - 3277
6	Shale, brick-red, with considerable interbedded greenish-gray shale and a little very fine grained light-gray sandstone	3277 - 3283
4	Sandstone, very fine grained, reddish-brown, with some interbedded brick-red silty shale and a little greenish-gray shale	3283 - 3287
7	Shale, brick-red, silty, with considerable interbedded greenish-gray shale and a little very fine grained light-gray sandstone	3287 - 3294
14	Sandstone, fine-grained, light-gray to pink, with considerable interbedded brick-red silty shale containing some muscovite	3294 - 3308
7	Shale, brick-red, sandy	3308 - 3315
9	Sandstone, very fine grained, brick-red, with some interbedded brick-red silty shale	3315 - 3324
4	Shale, brick-red, sandy, with a little interbedded very fine grained light-gray sandstone	3324 - 3328
4	Sandstone, very fine grained, brick-red, with some interbedded brick-red silty shale and a little greenish-gray shale	3328 - 3332
2	Sandstone, very fine to fine-grained, light-gray to pink	3332 - 3334
4	Sandstone, fine-grained, light-gray	3334 - 3338
5	Sandstone, fine-grained, light-gray to pink, with some interbedded brick-red silty shale	3338 - 3343
	Whirlpool sandstone, 15 feet	
7	Sandstone, fine-grained, light-gray	3343 - 3350

Thickness Feet	Description of Strata	Depth in feet
8	Sandstone, very fine to fine-grained, light-gray	3350 - 3358
	ORDOVICIAN SYSTEM, 2837 feet	
	Upper Ordovician or Cincinnatian Series, 1984 feet	
	Queenston shale, 1049 feet	
10	Shale, dark brick-red, slightly calcareous	3358 - 3368
56	Shale, dark brick-red, in part silty and somewhat calcareous	3368 - 3424
282	Shale, brick-red, in part silty and somewhat calcareous	3424 - 3706
44	Shale, brick-red, in part silty	3706 - 3750
24	Shale, brick-red, in part silty and slightly calcareous, with a little interbedded greenish-gray siltstone	3750 - 3774
102	Shale, brick-red, in part silty and somewhat calcareous	3774 - 3876
44	Shale, brick-red, in part silty and somewhat calcareous, with a little interbedded greenish-gray shale	3876 - 3920
88	Shale, brick-red, in part silty and somewhat calcareous	3920 - 4008
34	Shale, dark brick-red, sandy and somewhat calcareous	4008 - 4042
22	Shale, brick-red, sandy and somewhat calcareous, with a little interbedded greenish-gray shale	4042 - 4064
17	Shale, brick-red, in part silty and somewhat calcareous	4064 - 4081
94	Shale, brick-red, sandy and somewhat calcareous	4081 - 4175
22	Sandstone, very fine grained, reddish-brown, argillaceous and somewhat calcareous, with some interbedded brick-red sandy shale	4175 - 4197
17	Shale, brick-red, sandy	4197 - 4214

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Sandstone, very fine grained, reddish-brown, argillaceous and somewhat calcareous, containing a little muscovite, with a little interbedded brick-red shale	4214 - 4229
43	Shale, brick-red, sandy and somewhat calcareous, containing a little muscovite, with some interbedded very fine grained reddish-brown argillaceous sandstone	4229 - 4272
54	Sandstone, very fine grained, brick-red, argillaceous and slightly calcareous, containing a little muscovite	4272 - 4326
20	Sandstone, very fine grained, reddish-brown, argillaceous and slightly calcareous, containing a little muscovite, with considerable interbedded brick-red silty shale	4326 - 4346
29	Shale, brick-red, sandy, with a little interbedded greenish-gray shale	4346 - 4375
32	Sandstone, very fine grained, greenish- and reddish-gray, argillaceous and slightly calcareous, with a little interbedded greenish-gray and reddish-gray shale	4375 - 4407
	Oswego sandstone, 117 feet	
5	Sandstone, very fine grained, greenish-gray, argillaceous and slightly calcareous	4407 - 4412
12	Sandstone, very fine grained, greenish-gray, argillaceous and slightly calcareous, with a little interbedded greenish-gray shale and purplish-gray siltstone	4412 - 4424
16	Sandstone, very fine grained, greenish-gray, argillaceous and slightly calcareous, with a little interbedded greenish-gray and brick-red shale	4424 - 4440
15	Sandstone, very fine grained, greenish-gray, argillaceous and slightly calcareous, with some interbedded greenish-gray shale	4440 - 4455
5	Sandstone, very fine grained, greenish-gray, with considerable interbedded dark-gray shale and a little dark purplish-gray shale	4455 - 4460
22	Sandstone, very fine to fine-grained, light greenish-gray, slightly calcareous	4460 - 4482
15	Shale, greenish-gray, silty	4482 - 4497

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
27	Siltstone, greenish-gray, with considerable interbedded gray to dark-gray shale	4497 - 4524
	Lorraine shale, 556 feet	
32	Shale, gray, with a little interbedded greenish-gray, slightly calcareous shale	4524 - 4556
40	Siltstone, greenish-gray, slightly calcareous, with a great deal of interbedded gray shale	4556 - 4596
35	Shale, gray to dark-gray, with some interbedded greenish-gray, slightly calcareous shale	4596 - 4631
147	Shale, gray, with a little interbedded greenish-gray siltstone containing fragments of shells	4631 - 4778
46	Shale, gray, with some interbedded greenish-gray siltstone containing occasional fragments of shells	4778 - 4824
151	Shale, gray, with a little interbedded greenish-gray siltstone, containing occasional fragments of shells	4824 - 4975
39	Shale, gray, with some interbedded greenish-gray siltstone, containing abundant fragments of shells	4975 - 5014
66	Shale, gray, with a little interbedded greenish-gray calcareous siltstone	5014 - 5080
	Utica shale, 262 feet	
38	Shale, dark-gray, somewhat calcareous, with a little interbedded greenish-gray siltstone	5080 - 5118
31	Shale, dark-gray, in part silty and slightly calcareous	5118 - 5149
116	Shale, dark-gray, with some interbedded gray, somewhat calcareous siltstone	5149 - 5265
77	Shale, dark-gray, in part silty and somewhat calcareous	5265 - 5342

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
	Middle Ordovician or Champlainian Series, 767 feet	
	Top of Trenton limestone	5342
31	Limestone, very fine, dense, dark brownish-gray, argillaceous, containing fragments of shells, with considerable interbedded dark-gray shale	5342 - 5373
20	Limestone, very fine, dense, dark brownish-gray, argillaceous, containing fragments of shells	5373 - 5393
55	Limestone, very fine, crystalline to dense, mottled light and dark brownish-gray, containing abundant fragments of shells	5393 - 5448
208	Limestone, dark-gray, shaly, containing fragments of shells	5448 - 5656
63	Limestone, very fine, dense, dark brownish-gray, argillaceous, containing fragments of shells, with some interbedded very dark gray calcareous shale	5656 - 5719
118	Limestone, very fine, crystalline, brownish-gray, containing fragments of shells, with considerable interbedded dark brownish-gray shaly limestone	5719 - 5837
16	Limestone, very fine, dense, dark brownish-gray, somewhat argillaceous, containing fragments of shells	5837 - 5853
39	Limestone, very fine, dense, brownish-gray, somewhat argillaceous, with a little interbedded light-gray bentonite	5853 - 5892
72	Limestone, very fine, dense, brownish-gray, somewhat argillaceous	5892 - 5964
16	Limestone, very fine, dense, brownish-gray, somewhat argillaceous, with a little interbedded slightly calcareous black shale	5964 - 5980
8	Limestone, very fine, dense, brownish- to dark brownish-gray, somewhat argillaceous	5980 - 5988
36	Limestone, very fine, dense, brownish-gray, argillaceous, with some interbedded light greenish-gray bentonite; show of OIL and a little GAS at 5994 feet	5988 - 6024

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
23	Limestone, very fine, crystalline, brownish-gray, dolomitic, with a great deal of interbedded very fine, dense, brownish-gray somewhat argillaceous limestone; show of GAS at 6030 feet	6024 - 6047
15	Limestone, very fine, crystalline, brownish-gray	6047 - 6062
11	Limestone, very fine, dense, light brownish- to brownish-gray, slightly magnesian	6062 - 6073
19	Limestone, very fine, dense to crystalline, light brownish- to brownish-gray, somewhat argillaceous and slightly magnesian	6073 - 6092
17	Limestone, very fine, dense, light-gray, somewhat argillaceous and slightly magnesian	6092 - 6109
	Lower Ordovician or Canadian Series, 86 feet	
	Tribes Hill limestone, 86 feet	
12	Limestone, very fine, dense, brownish-gray, somewhat magnesian	6109 - 6121
7	Limestone, fine, oolitic, argillaceous, silty and slightly magnesian; oolites, dark brownish-gray and matrix, light-gray	6121 - 6128
5	Limestone, very fine, dense, dark brownish-gray, argillaceous	6128 - 6133
8	Limestone, fine, oolitic, argillaceous, silty and slightly magnesian; oolites, dark brownish-gray and matrix, light-gray	6133 - 6141
31	Limestone, very fine, crystalline, light-gray, somewhat argillaceous, silty and magnesian, with a few fine subrounded and frosted quartz grains in upper part	6141 - 6172
17	Limestone, very fine, dense to very fine crystalline, light brownish-gray, argillaceous, silty and somewhat magnesian; 25,000 cubic feet of GAS at 6182 feet	6172 - 6189
6	Limestone, light-gray, shaly, silty, and somewhat magnesian, containing a few fine- to medium-rounded and frosted quartz grains	6189 - 6195

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
	CAMBRIAN SYSTEM, 949+ feet	
	Upper Cambrian Series, 949+ feet	
	Little Falls dolomite, 130 feet	
5	Dolomite, fine, crystalline, light brownish-gray, containing considerable very fine to fine quartz sand, the larger grains of which are subrounded and frosted	6195 - 6200
57	Dolomite, fine, crystalline, light brownish-gray	6200 - 6257
32	Dolomite, fine,crystalline, light-gray	6257 - 6289
10	Dolomite, fine, crystalline, light-gray, containing considerable very fine to fine, angular quartz sand, with a few of the larger grains subrounded and frosted	6289 - 6299
12	Dolomite, fine, crystalline, light-gray, containing a great deal of very fine to fine, poorly sorted, subangular quartz sand, with a few rounded and frosted grains to .5 mm. in diameter	6299 - 6311
5	Sandstone, fine- to medium-grained, light brownish-gray, quartzose and dolomitic, with some of larger quartz grains rounded and frosted	6311 - 6316
9	Dolomite, very fine, crystalline, light brownish-gray, containing a great deal of very fine to fine, poorly sorted, subangular quartz sand, with a few of larger grains rounded and frosted	6316 - 6325
	Theresa formation, 643 feet	
10	Sandstone, fine- to medium-grained, light brownish-gray, quartzose and somewhat dolomitic, with most of quartz grains subangular, some of larger ones rounded and frosted	6325 - 6335
7	Sandstone, fine- to medium-grained, light brownish-gray, quartzose and slightly dolomitic, with most of quartz grains subangular, some of larger ones rounded and frosted	6335 - 6342
26	Sandstone, fine-grained, light-gray to light brownish-gray, subangular, quartzose, with a few of larger grains rounded and frosted	6342 - 6368

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
23	Sandstone, medium-grained, light brownish-gray, subangular, quartzose, with some of larger grains rounded and frosted; SALT WATER at 6375-6395	6368 - 6391
43	Sandstone, fine- to medium-grained, poorly sorted, light-gray to light brownish-gray, subangular, quartzose, with some of larger grains rounded and frosted	6391 - 6434
32	Sandstone, fine-grained, light brownish-gray, subangular, quartzose, with a few of larger grains rounded and frosted	6434 - 6466
4	Dolomite, very fine, dense, light brownish-gray, argillaceous and silty	6466 - 6470
7	Dolomite, very fine, crystalline, light-gray, containing considerable fine- to medium-grained, poorly sorted, quartz sand, with many rounded and frosted grains	6470 - 6477
13	Sandstone, medium-grained, light-gray, quartzose and somewhat dolomitic, containing many rounded and frosted grains	6477 - 6490
24	Sandstone, fine-grained, light-gray, quartzose and somewhat dolomitic, subangular, with few rounded and frosted grains	6490 - 6514
52	Dolomite, very fine, crystalline, light-gray to light brownish-gray, containing some very fine to fine subangular quartz sand, with a few grains rounded and frosted	6514 - 6566
4	Sandstone, very fine grained, light brownish-gray, quartzose and somewhat dolomitic, angular	6566 - 6570
18	Sandstone, very fine grained, light brownish-gray, quartzose and somewhat dolomitic, subangular, with a few of larger grains rounded and frosted	6570 - 6588
13	Dolomite, very fine, crystalline, light brownish-gray, containing some fine, subangular quartz sand, with a few of larger grains rounded and frosted	6588 - 6601
5	Sandstone, fine-grained, light brownish-gray, quartzose and somewhat dolomitic, subangular, with a few of larger grains rounded and frosted	6601 - 6606

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Dolomite, very fine, crystalline, light brownish-gray, containing some very fine to fine subangular quartz sand with some of larger grains rounded and frosted	6606 - 6616
10	Dolomite, very fine, crystalline, light brownish-gray, containing some very fine to fine subangular quartz sand with a few grains rounded and frosted and some chalk-textured chert	6616 - 6626
15	Dolomite, very fine, crystalline, light brownish-gray, containing some very fine, subangular quartz sand	6626 - 6641
47	Dolomite, very fine, crystalline, light brownish-gray, containing considerable very fine, subangular quartz sand	6641 - 6688
33	Dolomite, very fine to fine, crystalline, brownish-gray, containing some very fine to fine angular quartz sand with a few of larger grains rounded and frosted	6688 - 6721
34	Dolomite, very fine, crystalline, brownish-gray, containing considerable very fine, angular quartz sand and silt and some dark-gray clay	6721 - 6755
5	Dolomite, very fine, crystalline, brownish-gray, containing some very fine, angular quartz sand and silt and some dark-gray clay	6755 - 6760
70	No samples	6760 - 6830
24	Dolomite, very fine, crystalline, dark brownish gray, containing a great deal of very fine, subangular quartz sand and some dark-gray clay	6830 - 6854
25	Sandstone, fine-grained, light brownish-gray, subangular, quartzose and somewhat dolomitic	6854 - 6879
5	Dolomite, very fine, crystalline, light brownish-gray, containing some very fine subangular quartz sand and gray clay	6879 - 6884
2	Sandstone, fine- to medium-grained, light brownish-gray, quartzose and slightly dolomitic, subangular, with some of larger grains rounded and frosted	6884 - 6886

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Sandstone, very fine to fine-grained, light brownish-gray, quartzose and slightly dolomitic	6886 - 6897
3	Dolomite, very fine, crystalline, brownish-gray, containing considerable very fine to fine subangular quartz sand	6897 - 6900
20	Dolomite, very fine, crystalline, dark brownish-gray, containing some very fine to fine subangular quartz sand	6900 - 6920
48	Dolomite, very fine, crystalline, brownish-gray, containing considerable very fine to fine, subangular quartz sand with an occasional rounded and frosted grain	6920 - 6968
	Potsdam sandstone, 176+ feet	
32	Sandstone, very fine to fine-grained, light brownish-gray, quartzose and somewhat dolomitic, subangular, with an occasional rounded and frosted grain	6968 - 7000
15	Sandstone, very fine to fine-grained, light brownish-gray, quartzose and dolomitic, subangular, with an occasional rounded and frosted grain	7000 - 7015
12	Dolomite, very fine, crystalline, dark brownish-gray, containing considerable very fine to fine, subangular quartz sand with an occasional rounded and frosted grain	7015 - 7027
38	Sandstone, fine-grained, light-gray, quartzose and slightly dolomitic, subangular, with an occasional rounded and frosted grain; considerable SALT WATER at 7040 feet, rose 5500 feet	7027 - 7065
30	Sandstone, very fine to fine-grained, light brownish-gray, slightly calcareous, quartz grains mostly subangular	7065 - 7095
8	Sandstone, very fine to fine-grained, light brownish-gray, somewhat dolomitic, quartz grains subangular, with a little interbedded light greenish-gray silty and micaceous shale	7095 - 7103
6	Sandstone, very fine to fine-grained, light brownish-gray, quartz grains subangular	7103 - 7109

Arcade No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Sandstone, very fine grained, light brownish-gray, with a little interbedded dark-gray shale	7109 - 7124
9	Sandstone, very fine grained, light brownish-gray, slightly dolomitic and containing a little muscovite	7124 - 7133
11	Sandstone, very fine grained, light-pink, containing a few orthoclase grains and a little muscovite, quartz grains subangular	7133 - 7144
	TOTAL DEPTH	7144

WELL-SAMPLE RECORD

NO.

35

WELL-SAMPLE RECORD

ARTHUR SHELDON NO. 1 WELL
S. J. BRENDEL ET AL

Allegany County, New York, Town of Allen
Angelica Quadrangle: 1.72 miles south of 42° 25' N. Lat. and 1.89 miles west of 78° 00' W. Long.
Completed: November 23, 1932.
Elevation: 1620 feet above sea level.
Total depth: 3027 feet.
Deepest formation: Bertie limestone.
Result: An initial open flow of 200,000 cubic feet of gas per day, a show of oil, and some salt water encountered in the Oriskany sandstone. No commercial production.
Samples: 0 to 3027 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 2972+ feet	
	Upper Devonian Series, 2340+ feet	
7	Soil	0 - 7
63	Sandstone, fine-grained, bluish-gray, fossiliferous	7 - 70
15	Shale, greenish-gray, sandy	70 - 85
10	Sandstone, fine-grained, light greenish-gray, slightly calcareous	85 - 95
7	Sandstone, fine-grained, light grayish-brown, slightly calcareous	95 - 102
5	Shale, greenish-gray, sandy	102 - 107
23	Sandstone, very fine grained, light grayish-brown, slightly calcareous, with some interbedded greenish-gray sandy shale	107 - 130
54	Shale, greenish-gray, sandy	130 - 184
18	Shale, greenish-gray	184 - 202
8	Sandstone, very fine grained, greenish-gray	202 - 210

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Shale, gray	210 - 224
24	Shale, gray, with some interbedded greenish-gray sandy shale	224 - 248
24	Shale, gray	248 - 272
6	Shale, dark-gray, sandy	272 - 278
7	Shale, greenish-gray, sandy	278 - 285
23	Shale, dark to very dark gray, sandy	285 - 308
6	Shale, grayish-black	308 - 314
6	Shale, gray to dark-gray, sandy	314 - 320
42	Shale, gray to very dark gray	320 - 362
8	Shale, dark-gray, sandy	362 - 370
15	Sandstone, very fine grained, light-gray, slightly calcareous	370 - 385
8	Shale, greenish-gray, sandy	385 - 393
6	Sandstone, very fine grained, gray, slightly calcareous	393 - 399
12	Shale, dark-gray	399 - 411
12	Shale, gray, sandy	411 - 423
37	Shale, gray, with a great deal of interbedded sandy shale	423 - 460
21	Sandstone, very fine grained, light-gray	460 - 481
5	Shale, very dark gray, almost black	481 - 486
31	Shale, gray to dark-gray, sandy	486 - 517
6	Shale, grayish-black	517 - 523
11	Shale, gray to dark-gray, sandy	523 - 534
6	Shale, gray	534 - 540
17	Shale, greenish-gray, sandy	540 - 557
24	Shale, gray	557 - 581

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Shale, grayish-black, Dunkirk	581 - 593
6	Shale, greenish-gray, sandy	593 - 599
6	Sandstone, very fine grained, greenish-gray, somewhat calcareous	599 - 605
12	Shale, greenish-gray, sandy	605 - 617
6	Sandstone, very fine grained, greenish-gray, slightly calcareous	617 - 623
12	Shale, gray	623 - 635
6	Shale, greenish-gray, sandy	635 - 641
25	Sandstone, very fine grained, greenish-gray, slightly calcareous	641 - 666
18	Shale, gray, sandy	666 - 684
18	Sandstone, very fine grained, light greenish-gray, slightly calcareous	684 - 702
6	Shale, gray, sandy	702 - 708
6	Sandstone, very fine grained, light greenish-gray	708 - 714
12	Shale, gray, sandy	714 - 726
5	Shale, gray	726 - 731
6	Shale, gray, sandy	731 - 737
18	Shale, dark to very dark gray	737 - 755
35	Shale, grayish-black	755 - 790
10	Sandstone, very fine grained, light greenish-gray	790 - 800
175	Shale, gray, sandy	800 - 975
6	Sandstone, very fine grained, gray, slightly calcareous	975 - 981
18	Shale, gray, sandy	981 - 999
6	Sandstone, very fine grained, greenish-gray slightly calcareous	999 - 1005

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, gray	1005 - 1023
47	Sandstone, very fine grained, grayish-brown, slightly calcareous	1023 - 1070
20	Shale, gray, sandy	1070 - 1090
20	Shale, gray	1090 - 1110
10	Shale, gray, sandy	1110 - 1120
10	Shale, brownish-black	1120 - 1130
10	Shale, gray	1130 - 1140
6	Sandstone, very fine grained, grayish-brown, somewhat calcareous	1140 - 1146
12	Shale, gray, sandy	1146 - 1158
7	Sandstone, very fine grained, grayish-brown, somewhat calcareous	1158 - 1165
88	Shale, gray, with some interbedded very dark gray shale	1165 - 1253
67	Shale, gray, sandy	1253 - 1320
10	Sandstone, very fine grained, grayish-brown, slightly calcareous	1320 - 1330
10	Shale, gray	1330 - 1340
10	Sandstone, very fine grained, grayish-brown, slightly calcareous	1340 - 1350
10	Shale, gray	1350 - 1360
30	Shale, gray, sandy	1360 - 1390
20	Shale, gray	1390 - 1410
10	Shale, dark-gray, sandy	1410 - 1420
40	Shale, gray to dark-gray	1420 - 1460
20	Shale, dark-gray	1460 - 1480
20	Shale, very dark gray	1480 - 1500
10	Shale, gray	1500 - 1510

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
70	Shale, very dark gray	1510 - 1580
10	Shale, dark-gray	1580 - 1590
10	Shale, dark-gray, sandy	1590 - 1600
20	Shale, gray to dark-gray	1600 - 1620
10	Shale, very dark gray	1620 - 1630
30	Shale, gray to dark-gray	1630 - 1660
40	Shale, dark-gray	1660 - 1700
10	Shale, very dark gray	1700 - 1710
20	Shale, dark-gray	1710 - 1730
30	Shale, very dark gray	1730 - 1760
20	Shale, gray to dark-gray	1760 - 1780
10	Shale, very dark gray, almost black	1780 - 1790
10	Shale, gray to dark-gray	1790 - 1800
10	Shale, dark-gray	1800 - 1810
10	Shale, grayish-black	1810 - 1820
20	Shale, dark to very dark gray	1820 - 1840
20	Shale, gray to dark-gray	1840 - 1860
20	Shale, dark-gray	1860 - 1880
20	Shale, gray, sandy, slightly calcareous	1880 - 1900
20	Shale, gray, slightly calcareous	1900 - 1920
20	Shale, dark-gray, slightly calcareous	1920 - 1940
20	Shale, gray, slightly calcareous	1940 - 1960
50	Shale, dark-gray, slightly calcareous	1960 - 2010
10	Shale, black, slightly calcareous	2010 - 2020
20	Shale, dark-gray, slightly calcareous	2020 - 2040
20	Shale, dark-gray	2040 - 2060

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
70	Shale, very dark gray	2060 - 2130
10	Shale, grayish-black	2130 - 2140
20	Shale, dark-gray	2140 - 2160
20	Shale, dark-gray, somewhat calcareous	2160 - 2180
10	Shale, dark-gray, sandy, somewhat calcareous	2180 - 2190
20	Shale, very dark gray, slightly calcareous	2190 - 2210
20	Shale, dark-gray, somewhat calcareous	2210 - 2230
10	Shale, very dark gray, calcareous	2230 - 2240
20	Shale, very dark gray, almost black, somewhat calcareous	2240 - 2260
10	Shale, dark-gray, somewhat calcareous	2260 - 2270
20	Shale, very dark gray, almost black	2270 - 2290
20	Shale, grayish-black	2290 - 2310
20	Shale, grayish-black, somewhat calcareous	2310 - 2330
10	Shale, black, somewhat calcareous	2330 - 2340
	Middle Devonian Series, 611 feet	
	Tully limestone, 64 feet	
20	Limestone, very fine, dense, grayish-brown	2340 - 2360
18	Limestone, very fine, dense, dark grayish-brown	2360 - 2378
26	Limestone, very fine, dense, dark brownish-gray, platy, with some interbedded very dark gray calcareous shale	2378 - 2404
	Hamilton group, 452 feet	
26	Shale, dark-gray, calcareous	2404 - 2430
50	Shale, dark-gray, slightly calcareous	2430 - 2480
6	Limestone, very fine, dense, brownish-gray, fossiliferous	2480 - 2486

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
133	Shale, dark-gray and very dark gray, somewhat calcareous	2486 - 2619
4	Limestone, very fine, dense, dark brownish-gray, fossiliferous	2619 - 2623
20	Shale, very dark gray, somewhat calcareous	2623 - 2643
93	Shale, very dark gray, calcareous	2643 - 2736
9	Shale, grayish-black, somewhat calcareous	2736 - 2745
10	Shale, very dark gray, somewhat calcareous	2745 - 2755
45	Shale, very dark gray, calcareous	2755 - 2800
17	Shale, very dark gray, somewhat calcareous	2800 - 2817
4	Limestone, very fine, dense, brownish-gray, fossiliferous	2817 - 2821
9	Shale, very dark gray, slightly calcareous	2821 - 2830
10	Shale, grayish-black, slightly calcareous	2830 - 2840
10	Shale, black, slightly calcareous	2840 - 2850
6	Shale, grayish-black	2850 - 2856
	Onondaga limestone, 95 feet	
61	Limestone, very fine, dense, dark brownish-gray	2856 - 2917
6	Limestone, very fine, dense, very dark gray, argillaceous	2917 - 2923
28	Limestone, very fine, dense, brownish-gray, cherty	2923 - 2951
	Lower Devonian Series, 21 feet	
	Oriskany sandstone, 21 feet	
21	Sandstone, fine- to medium-grained, light-gray, somewhat calcareous	2951 - 2972

Sheldon No. 1

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 55+ feet	
	Upper Silurian or Cayugan Series, 55+ feet	
	Cobleskill limestone, 23 feet	
23	Limestone, very fine, crystalline, light brownish-gray to brownish-gray, magnesian	2972 - 2995
	Salina group, 32+ feet	
32	Limestone, very fine, dense, grayish-brown to dark grayish-brown, argillaceous, magnesian, Bertie	2995 - 3027
	TOTAL DEPTH	3027

WELL-SAMPLE RECORD

NO.

36

WELL-SAMPLE RECORD

T. H. SAWYER NO. 1 WELL
T. H. SAWYER AND BELMONT QUADRANGLE DRILLING CORPORATION

Allegany County, New York, Town of Wirt
Belmont Quadrangle: .80 mile north of 42° 05' N. Lat. and .42 mile east of 78° 10' W. Long.
Completed: 1929
Elevation: 1860 feet above sea level.
Total Depth: 4847 feet.
Deepest formation: Salina.
Result: Dry hole.
Samples: 3782 to 4847 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4438+ feet	
	Upper Devonian Series, 3850+ feet	
3728	No samples	0 - 3782
	Top of Richburg sand	1008
10	Shale, grayish-black, somewhat calcareous	3782 - 3792
24	Shale, grayish-black	3792 - 3816
34	Shale, grayish-black, calcareous	3816 - 3850
	Middle Devonian Series, 583 feet	
	Tully limestone, 32 feet	
32	Limestone, dense, grayish-brown	3850 - 3882
	Hamilton group, 465 feet	
5	Shale, very dark brownish-gray	3882 - 3887
6	Shale, grayish-black, somewhat calcareous	3887 - 3893
6	Shale, very dark gray, calcareous	3893 - 3899
6	Shale, grayish-black, somewhat calcareous	3899 - 3905
13	Shale, grayish-black, calcareous	3905 - 3918

Thickness Feet	Description of Strata	Depth in feet
5	Shale, grayish-black, very calcareous	3918 - 3923
5	Shale, grayish-black, calcareous	3923 - 3928
19	Shale, very dark gray, calcareous	3928 - 3947
6	Shale, grayish-black, calcareous	3947 - 3953
5	Limestone, dense, brownish-gray	3953 - 3958
5	Shale, dark-gray, very calcareous	3958 - 3963
6	Shale, dark-gray, calcareous	3963 - 3969
29	Shale, very dark gray, very calcareous	3969 - 3998
30	Shale, grayish-black, very calcareous	3998 - 4028
3	Shale, grayish-black, calcareous	4028 - 4031
20	Shale, very dark gray, calcareous	4031 - 4051
6	Shale, grayish-black, calcareous	4051 - 4057
6	Shale, very dark gray, calcareous	4057 - 4063
18	Shale, grayish-black, calcareous	4063 - 4081
12	Shale, very dark gray, calcareous	4081 - 4093
24	Shale, grayish-black, calcareous	4093 - 4117
34	Shale, very dark, calcareous	4117 - 4151
27	Shale, grayish-black, calcareous	4151 - 4178
18	Shale, very dark gray, calcareous	4178 - 4196
8	Limestone, dense, dark grayish-brown, with one foot of interbedded grayish-black calcareous shale at middle	4196 - 4204
21	Shale, black, calcareous	4204 - 4225
10	Shale, grayish-black, calcareous	4225 - 4235
30	Shale, black, calcareous, with a thin seam of dense, light-brown limestone near base	4235 - 4265
20	Shale, grayish-black, calcareous	4265 - 4285
19	Shale, black, calcareous	4285 - 4304

Sawyer No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, black, calcareous, with a few thin seams of dense, light grayish-brown limestone	4304 - 4310
15	Shale, black, calcareous	4310 - 4325
10	Shale, grayish-black, calcareous	4325 - 4335
10	Shale, black, calcareous	4335 - 4345
2	Shale, black, brecciated minute fractures filled with calcite; large GAS pocket encountered at this horizon	4345 - 4347
	Onondaga limestone, 86 feet	
86	Limestone, very fine, crystalline, brownish-gray, siliceous, cherty in lower part	4347 - 4433
	Lower Devonian Series, 5 feet	
	Oriskany sandstone, 5 feet	
5	Sandstone, fine- to medium-grained, quartz, calcareous	4433 - 4438
	SILURIAN SYSTEM, 409+ feet	
	Upper Silurian or Cayugan Series, 409+ feet	
	Cobleskill limestone, 18 feet	
18	Limestone, very fine, crystalline, grayish-brown to dark grayish-brown	4438 - 4456
	Salina group, 391+ feet	
	Bertie limestone, 42 feet	
14	Limestone, very fine, crystalline, light-gray	4456 - 4470
28	Limestone, very fine, crystalline, dark brownish-gray	4470 - 4498
	Bottom of Bertie limestone	4498
76	Limestone and dolomite, very fine, crystalline, dark brownish-gray, argillaceous, magnesian, contains anhydrite	4498 - 4574

Sawyer No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Limestone, very fine, crystalline, gray to dark-gray, argillaceous, contains anhydrite	4574 - 4585
45	Limestone, very fine, crystalline, brownish-gray, argillaceous, contains anhydrite	4585 - 4630
110	Limestone and dolomite, very fine, crystalline, dark grayish-brown, argillaceous, magnesian, contains anhydrite	4630 - 4740
5	Salt, medium to coarse, crystalline	4740 - 4745
10	Limestone, very fine, crystalline, dark brownish-gray, argillaceous, contains anhydrite	4745 - 4755
56	Salt, medium, crystalline	4755 - 4811
5	Shale, light-gray, slightly calcareous	4811 - 4816
31	Limestone, very fine, crystalline, light-gray, argillaceous	4816 - 4847
	TOTAL DEPTH	4847

WELL-SAMPLE RECORD

NO.

37

WELL-SAMPLE RECORD

A. GILBERT NO. 1 WELL
BELMONT QUADRANGLE DRILLING CORPORATION

Allegany County, New York, Town of Wirt
Belmont Quadrangle: 2.38 miles north of 42° 05' N. Lat. and 1.10 miles east of 78° 10' W. Long.
Completed: September 11, 1928 to Tully, later deepened through Albion.
Elevation: 2072 feet above sea level.
Total depth: 6250 feet.
Deepest formation: Queenston shale.
Result: Show of gas in Richburg sand of Upper Devonian; 3,500,000 cubic feet of gas per day containing a high percentage of distillate, initial open flow, from Tully limestone of Middle Devonian at 3990 feet; dry in formations below the Tully.
Remarks: Well started about 65 feet below the bottom of the Wolf Creek conglomerate at the base of the Cattaraugus formation. The Gilbert well inaugurated the deep-sand exploratory campaign in south-central New York and north-central Pennsylvania which led to the discovery of the many Oriskany sand gas pools of that area. With the exception of four small producers in the vicinity of Elmira, New York, it was the only well in which commercial production was encountered in the Tully limestone.
Samples: 255 to 4008 feet examined by Chas R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4338+ feet	
	Upper Devonian Series, 3990+ feet	
	Conneaut group, 640+ feet	
255	No samples	0 - 255
5	Sandstone, very fine grained, dark brownish-gray	255 - 260
94	No samples	260 - 354
14	Shale, greenish-gray, sandy, with some interbedded very fine grained dark brownish-gray sandstone	354 - 368
8	Sandstone, fine-grained, very dark reddish brown, fossiliferous	368 - 376

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Shale, greenish-gray, sandy	376 - 385
10	Sandstone, fine-grained, very light greenish gray	385 - 395
5	Sandstone, fine-grained, dark reddish-brown, somewhat calcareous	395 - 400
2	Sandstone, fine-grained, very light greenish gray	400 - 402
6	Shale, greenish-gray	402 - 408
137	No samples	408 - 545
	Top of Cuba sandstone	545
55	Sandstone, fine-grained, nearly white, somewhat calcareous	545 - 600
15	Shale, greenish-gray, sandy	600 - 615
5	Sandstone, fine-grained, very light greenish gray, somewhat calcareous	615 - 620
10	Shale, greenish-gray	620 - 630
10	Sandstone, fine-grained, nearly white, somewhat calcareous	630 - 640
	Bottom of Cuba sandstone	640
	Canadaway group, 1506 feet	
44	Shale, greenish-gray, sandy, fossiliferous	640 - 684
5	Sandstone, fine-grained, light greenish-gray, somewhat calcareous	684 - 689
55	Shale, greenish-gray, sparingly fossiliferous	689 - 744
6	Sandstone, fine-grained, light-gray, somewhat calcareous	744 - 750
20	Shale, greenish-gray, sandy	750 - 770
5	Sandstone, fine-grained, light greenish-gray, somewhat calcareous	770 - 775
41	Shale, greenish-gray, sandy, fossiliferous	775 - 816

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, fine-grained, light greenish-gray, somewhat calcareous	816 - 822
6	Shale, greenish-gray, sandy	822 - 828
87	Shale, greenish-gray, fossiliferous	828 - 915
6	Sandstone, fine-grained, light-gray, calcareous	915 - 921
36	Shale, greenish-gray	921 - 957
16	Shale, greenish-gray, sandy, fossiliferous	957 - 973
7	Sandstone, fine-grained, light-gray, calcareous	973 - 980
20	Shale, greenish-gray, fossiliferous	980 - 1000
5	Sandstone, fine-grained, light-gray, calcareous	1000 - 1005
11	Shale, greenish-gray	1005 - 1016
6	Sandstone, fine-grained, light-gray	1016 - 1022
30	Shale, greenish-gray	1022 - 1052
16	Sandstone, fine-grained, light-gray, calcareous	1052 - 1068
11	Shale, greenish-gray, sandy, fossiliferous	1068 - 1079
35	Shale, greenish-gray	1079 - 1114
16	Sandstone, fine-grained, light chocolate-brown, fossiliferous and calcareous, Richburg Stray sand	1114 - 1130
26	Shale, greenish-gray	1130 - 1156
28	Sandstone, fine-grained, chocolate-brown, fossiliferous and calcareous, show of GAS, Richburg sand	1156 - 1184
84	Shale, greenish-gray	1184 - 1268
6	Sandstone, fine-grained, chocolate-brown	1268 - 1274
118	Shale, greenish-gray	1274 - 1392

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Sandstone, fine-grained, chocolate-brown, somewhat calcareous, with a four-foot layer of greenish-gray shale at middle	1392 - 1406
92	Shale, greenish-gray, with some interbedded thin layers of fine-grained light grayish-brown sandstone	1406 - 1498
10	Sandstone, fine-grained, chocolate-brown, fossiliferous and somewhat calcareous	1498 - 1508
44	Shale, greenish-gray	1508 - 1552
40	Shale, greenish-gray, sandy	1552 - 1592
145	Shale, gray to very dark gray, in part sandy	1592 - 1737
6	Shale, grayish-black	1737 - 1743
26	Shale, very dark gray, sandy	1743 - 1769
25	Shale, very dark gray, with some interbedded light-gray sandy shale	1769 - 1794
47	Shale, greenish-gray, sandy, with some interbedded grayish-black shale	1794 - 1841
5	Sandstone, very fine grained, light greenish-gray, somewhat calcareous	1841 - 1846
9	Shale, greenish-gray, sandy	1846 - 1855
28	Shale, sandy, with some interbedded gray shale	1855 - 1883
38	Shale, greenish-gray, sandy	1883 - 1921
7	Shale, grayish-black	1921 - 1928
168	Shale, greenish-gray, sandy, calcareous	1928 - 2096
38	Shale, gray	2096 - 2134
12	Shale, grayish-black, Dunkirk	2134 - 2146
	Bottom of Canadaway group	2146
27	Shale, greenish-gray, sandy, somewhat calcareous	2146 - 2173

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Shale, gray	2173 - 2190
14	Shale, greenish-gray, sandy, calcareous	2190 - 2204
66	Shale, gray, with some interbedded greenish-gray sandy shale	2204 - 2270
22	Shale, greenish-gray, sandy, calcareous	2270 - 2292
93	Shale, gray to greenish-gray, and sandy shale	2292 - 2385
6	Sandstone, very fine grained, light greenish-gray, somewhat calcareous	2385 - 2391
12	Shale, greenish-gray, sandy	2391 - 2403
7	Sandstone, very fine grained, light greenish-gray, somewhat calcareous	2403 - 2410
15	Shale, greenish-gray, with some interbedded grayish-black shale	2410 - 2425
7	Sandstone, very fine grained, light brownish-gray	2425 - 2432
58	Shale, greenish-gray, sandy	2432 - 2490
7	Shale, grayish-black, with considerable interbedded greenish-gray shale	2490 - 2497
51	Shale, dark-gray	2497 - 2548
8	Shale, grayish-black, with some interbedded greenish-gray shale	2548 - 2556
86	Shale, gray to dark-gray, with a little interbedded greenish-gray sandy shale and very fine grained greenish-gray sandstone	2556 - 2642
8	Sandstone, very fine grained, brownish-gray	2642 - 2650
8	Shale, greenish-gray, sandy	2650 - 2658
50	Shale, gray to dark-gray, with some interbedded greenish-gray sandy shale	2658 - 2708
8	Sandstone, very fine grained, brownish-gray, somewhat calcareous	2708 - 2716
16	Shale, gray, sandy	2716 - 2732

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Shale, gray	2732 - 2757
15	Shale, greenish-gray, sandy	2757 - 2772
14	Shale, gray to dark-gray	2772 - 2786
7	Shale, grayish-black, with some interbedded gray shale	2786 - 2793
151	Shale, gray, with a little interbedded gray sandy shale and very fine grained sandstone	2793 - 2944
9	Shale, gray, with some interbedded very fine grained gray sandstone	2944 - 2953
35=	Shale, gray	2953 - 2988
8	Shale, grayish-black, with some interbedded gray shale	2988 - 2996
79	Shale, gray, with a little interbedded very fine grained gray sandstone	2996 - 3075
8	Shale, grayish-black, with some interbedded gray shale	3075 - 3083
11	Shale, gray	3083 - 3094
7	Shale, grayish-black, with some interbedded gray shale	3094 - 3101
119	Shale, gray to very dark gray, with a little interbedded very fine grained gray sandstone	3101 - 3220
16	Shale, grayish-black to black	3220 - 3236
6	Shale, gray	3236 - 3242
31	Shale, grayish-black to black	3242 - 3273
7	Shale, gray	3273 - 3280
7	Shale, grayish-black	3280 - 3287
23	Shale, gray	3287 - 3310
8	Shale, grayish-black	3310 - 3318
8	Shale, gray to very dark gray	3318 - 3326
6	Shale, grayish-black	3326 - 3332

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
99	Shale, gray to dark-gray	3332 - 3431
14	Shale, grayish-black	3431 - 3445
171	Shale, dark-gray, calcareous	3445 - 3616
6	Shale, grayish-black	3616 - 3622
29	Shale, very dark gray	3622 - 3651
60	Shale, grayish-black	3651 - 3711
12	Shale, very dark gray	3711 - 3723
24	Shale, grayish-black	3723 - 3747
23	Shale, gray to dark-gray	3747 - 3770
57	Shale, dark-gray, calcareous	3770 - 3827
77	Shale, grayish-black, calcareous	3827 - 3904
24	Shale, grayish-black, somewhat calcareous	3904 - 3928
23	Shale, grayish-black	3928 - 3951
27	Shale, black, calcareous	3951 - 3978
12	Shale, black, slightly calcareous	3978 - 3990
	Middle Devonian Series, 640 feet	
	Tully limestone, 55 feet	
18	Limestone, dense, grayish-brown	3990 - 4008
2242	No samples	4008 - 6250
	From drillers' log	
	Bottom of Tully limestone	4045
493	Hamilton group	4045 - 4538
92	Onondaga limestone	4538 - 4630
	Lower Devonian Series, 8 feet	
8	Oriskany sandstone	4630 - 4638

Gilbert No. 1

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 1520 feet	
	Upper Silurian or Cayugan Series, 842 feet	
842	Salina group, including Cobleskill limestone	4638 - 5480
	Middle Silurian or Niagaran Series, 544 feet	
296	Lockport dolomite	5480 - 5776
248	Clinton group	5776 - 6024
	Lower Silurian or Albion Series, 114 feet	
134	Medina formation	6024 - 6158
	ORDOVICIAN SYSTEM, 92+ feet	
	Upper Ordovician or Cincinnatian Series, 92+ feet	
92	Queenston red shale	6158 - 6250
	TOTAL DEPTH	6250

WELL-SAMPLE RECORD

NO.

38

WELL-SAMPLE RECORD

CLARENCE C. LOBDELL NO. 1 WELL
BRADLEY PRODUCING CORPORATION
NEW YORK STATE NATURAL GAS CORPORATION
QUAKER STATE OIL REFINING CORPORATION

Chenango County, New York, Town of Columbus
New Berlin Quadrangle: 1.84 miles north of 42° 40' N. Lat., and .60 mile west of 75° 20' W. Lat.
Completed: November 12, 1949
Elevation: 1373 feet above sea level.
Total depth: 5701 feet
Deepest formation: Pre-Cambrian granite
Result: A little salt water at 2753 and 2793 feet, 2 bailers salt water in 24 hours at 2851 feet and 5 bailers salt water in 12 hours at 3020 feet in Clinton group; small show of gas and salt water at 3080 feet in Lorraine shale; brackish water rose 1000 feet in hole at 4693-4696 feet and 3400 feet in 24 hours at 4701-4704 feet, additional brackish water at 4782 feet and 4800 feet in Tribes Hill limestone; brackish water rose 300 feet at 5038 feet and 1150 feet, accompanied by a slight show of gas which soon exhausted itself at 5127 feet in Little Falls dolomite; brackish water at 5165, 5180, 5192, and 5246 feet in Theresa formation.
Samples: 244-5701 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 1632+ feet	
	Middle Devonian Series, 1563+ feet	
	Hamilton group, 1460+ feet	
244	No samples	0 - 244
5	Shale, dark-gray, sandy and slightly calcareous, containing fragments of shells and a little pyrite	244 - 249
12	Shale, dark-gray, sandy, containing fragments of shells including brachiopods, with a little interbedded very fine grained gray sandstone	249 - 261
29	Shale, dark-gray, sandy, containing fragments of shells	261 - 290

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, very dark gray, in part sandy, containing occasional fragments of shells	290 - 298
25	Shale, dark-gray, sandy, containing an occasional shell fragment	298 - 323
5	Shale, dark-gray, sandy, with some interbedded very dark gray shale	323 -- 328
5	Shale, dark-gray, in part silty	328 - 333
15	Shale, dark-gray, in part silty, with some interbedded very fine grained light-gray to gray sandstone containing abundant fragments of shells	333 - 348
72	Shale, dark-gray, sandy and slightly calcareous, containing occasional fragments of shells including brachiopods	348 - 420
5	Sandstone, very fine grained, dark-gray, argillaceous and slightly calcareous	420 - 425
14	Shale, dark-gray, sandy and slightly calcareous	425 - 439
26	Shale, very dark gray, with some interbedded dark-gray silty shale	439 - 465
17	Sandstone, very fine grained, dark-gray, argillaceous and slightly calcareous, with a great deal of interbedded dark to very dark gray shale	465 - 482
23	Shale, dark-gray, sandy and slightly calcareous	482 - 505
5	Siltstone, dark-gray, somewhat calcareous	505 - 510
9	Siltstone, dark-gray, somewhat calcareous, containing fragments of shells, with some interbedded dark-gray silty shale	510 - 519
14	Siltstone, gray, somewhat calcareous, containing fragments of shells	519 - 533
23	Shale, dark-gray, sandy and somewhat calcareous, containing fragments of shells	533 - 556
5	Sandstone, very fine grained, dark-gray, argillaceous and somewhat calcareous, containing fragments of shells	556 - 561

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, dark-gray, sandy and slightly calcareous, containing fragments of shells	561 - 579
57	Shale, dark-gray, silty	579 - 636
59	Shale, dark to very dark gray, in part silty	636 - 695
49	Shale, dark to very dark gray	695 - 744
13	Sandstone, very fine grained, dark-gray, argillaceous and slightly calcareous, containing an occasional shell fragment, with a little interbedded dark to very dark gray shale	744 - 757
71	Shale, dark-gray, silty	757 - 828
10	Shale, dark to very dark gray, in part silty	828 - 838
18	Sandstone, very fine grained, light-gray to gray, argillaceous and slightly calcareous	838 - 856
5	Shale, dark-gray, sandy	856 - 861
17	Sandstone, very fine grained, dark-gray, argillaceous, containing occasional fragments of shells	861 - 878
41	Shale, dark to very dark gray, silty	878 - 919
65	Shale, very dark gray, in part silty	919 - 984
97	Shale, very dark gray, containing an occasional fragment of a brachiopod shell	984 - 1081
251	Shale, very dark gray to grayish-black	1081 - 1332
27	Shale, grayish-black	1332 - 1359
15	Shale, very dark gray to grayish-black	1359 - 1374
20	Shale, very dark gray, somewhat calcareous	1374 - 1394
20	Shale, very dark gray to grayish-black	1394 - 1414
16	Shale, grayish-black, slightly calcareous	1414 - 1430
8	Limestone, very fine, clastic, gray to dark gray, argillaceous	1430 - 1438
22	Shale, grayish-black, calcareous, with some interbedded very fine, clastic, light brownish to brownish gray, somewhat argillaceous limestone	1438 - 1460

Thickness Feet	Description of Strata	Depth in feet
	Onondaga formation, 103 feet	
16	Limestone, very fine, clastic, brownish to dark brownish gray, argillaceous, containing fragments of shells	1460 - 1476
33	Limestone, very fine, clastic, dark brownish gray, somewhat argillaceous, containing fragments of shells	1476 - 1509
22	Limestone, very fine, clastic, brownish-gray to gray, argillaceous, containing fragments of shells	1509 - 1531
9	Limestone, very fine, clastic, light-gray to brownish-gray, argillaceous, containing a little light-gray subchalcedonic chert	1531 - 1540
7	Shale, dark to very dark gray, calcareous, containing glauconite, with considerable interbedded dark-gray argillaceous porcellaneous chert also containing glauconite	1540 - 1547
6	Shale, dark-gray, somewhat calcareous, containing glauconite	1547 - 1553
	Lower Devonian Series, 79 feet	
	Helderberg group, 79 feet	
8	Limestone, fine, clastic, gray, argillaceous, containing abundant minute shell fragments and a little light to dark brownish gray subchalcedonic chert	1553 - 1561
34	Limestone, very fine, clastic, dark-gray, argillaceous and silty, containing abundant minute shell fragments, a few larger brachiopod shells, and a little light to dark brownish gray subchalcedonic chert with some interbedded dark-gray shale	1561 - 1595
37	Limestone, coarse, clastic, gray to dark-gray, somewhat argillaceous and silty, containing fragments of shells and a very little light bluish gray to dark gray subchalcedonic chert	1595 - 1632

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 1442 feet	
	Upper Silurian or Cayugan Series, 1045 feet	
	Manlius limestone, 103 feet	
20	Limestone, very fine, clastic, dark brownish gray, somewhat magnesian	1632 - 1652
19	Limestone, very fine, clastic, dark-gray, containing fragments of shells including crinoids	1652 - 1671
34	Limestone, coarse, clastic, gray to dark-gray, containing fragments of shells	1671 - 1705
5	Shale, grayish-black, with a little interbedded very fine, clastic, light-gray to gray limestone	1705 - 1710
9	Limestone, very fine clastic, dark-gray, argillaceous and silty, with some interbedded dark-gray shale	1710 - 1719
16	Limestone, very fine, clastic, dark-gray, somewhat argillaceous and silty, containing fragments of shells	1719 - 1735
	Rondout limestone, 40 feet	
6	Limestone, very fine, clastic, very dark gray, argillaceous and silty, somewhat magnesian	1735 - 1741
6	Limestone, very fine, clastic, very dark gray, argillaceous and silty, somewhat magnesian, with considerable interbedded very dark gray to grayish-black very slightly calcareous shale	1741 - 1747
8	Limestone, fine, clastic, dark-gray, argillaceous, magnesian, containing an occasional shell fragment and a very little anhydrite, with some interbedded grayish-black slightly calcareous shale	1747 - 1755
20	Limestone, very fine, clastic, light-gray, argillaceous, dolomitic, containing a little anhydrite	1755 - 1775

Thickness Feet	Description of Strata	Depth in feet
	Cobleskill limestone, 41 feet	
12	Limestone, fine, clastic, dark-gray, somewhat argillaceous, magnesian, containing an occasional fragment of a brachiopod shell	1775 - 1787
9	Limestone, very fine, clastic, very dark gray, somewhat argillaceous, magnesian	1787 - 1796
20	Limestone, very fine, clastic, dark-gray, somewhat argillaceous, magnesian, containing ostracod shells in lower part, with some interbedded, very fine, clastic, gray limestone	1796 - 1816
	Salina group, 861 feet	
	Camillus formation, 439 feet	
8	Shale, gray, somewhat calcareous, with considerable interbedded very fine, dense, light gray to gray, argillaceous magnesian limestone containing a little anhydrite	1816 - 1824
12	Limestone, very fine, dense, gray, argillaceous, magnesian, with considerable interbedded very fine, crystalline, light-gray to white anhydrite	1824 - 1836
38	Limestone, very fine, dense, dark-gray to dark brownish gray, argillaceous, magnesian, with some interbedded very fine, crystalline, light-gray anhydrite	1836 - 1874
6	Limestone, very fine, crystalline, dark brownish gray, dolomitic	1874 - 1880
56	Shale, gray to dark-gray, calcareous, with some interbedded very fine, crystalline, gray anhydrite	1880 - 1936
27	Shale, gray, calcareous, with some interbedded grayish-green slightly calcareous shale and a little grayish-red calcareous shale containing an occasional fine rounded quartz grain	1936 - 1963
33	Shale, brick-red, slightly calcareous, containing an occasional fine rounded quartz grain, with some interbedded grayish-green slightly calcareous shale and some interbedded very fine, crystalline, gray anhydrite	1963 - 1996

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, grayish-green, slightly calcareous, containing a little anhydrite, with some interbedded slightly calcareous brick-red shale	1996 - 2004
10	Shale, grayish-green, somewhat calcareous, containing a little anhydrite and an occasional fine to medium rounded quartz grains	2004 - 2014
20	Shale, grayish-green, slightly calcareous, containing a little anhydrite, with considerable interbedded brick-red shale, both grayish-green and brick-red shale contain occasional fine to medium rounded quartz grains	2014 - 2034
20	Limestone, very fine, dense, gray to dark-gray, shaly, containing a little anhydrite	2034 - 2054
26	Shale, grayish-green, slightly calcareous, containing a little anhydrite and occasional fine to medium rounded quartz grains	2054 - 2080
16	Limestone, very fine, dense, gray to dark-gray, magnesian, containing a little anhydrite	2080 - 2096
16	Limestone, very fine, dense, brownish to very dark brownish gray, argillaceous, magnesian, containing a little anhydrite, with some interbedded greenish-gray somewhat calcareous shale containing occasional fine to medium rounded quartz grains	2096 - 2112
14	Shale, gray, dolomitic, containing some anhydrite and occasional fine to medium subrounded to rounded quartz grains, with some interbedded very fine, dense, dark brownish gray argillaceous magnesian limestone	2112 - 2126
18	Limestone, very fine, dense, very dark gray, argillaceous, magnesian, with some interbedded gray dolomitic shale containing some anhydrite	2126 - 2144
10	Shale, dark to very dark gray, somewhat dolomitic, with some interbedded very fine, dense, dark to very dark gray argillaceous magnesian limestone containing a little anhydrite	2144 - 2154
30	Limestone, very fine, dense, very dark grayish brown, argillaceous, dolomitic, containing a little anhydrite	2154 - 2184
13	Shale, dark to very dark gray, somewhat dolomitic	2184 - 2197

Thickness Feet	Description of Strata	Depth in feet
32	Limestone, very fine, dense, dark to very dark brownish gray, argillaceous, magnesian, containing some anhydrite	2197 - 2229
26	Limestone, very fine, dense, light brownish gray, argillaceous, dolomitic, containing a little anhydrite with some interbedded gray slightly dolomitic shale	2229 - 2255
	Vernon shale, 355 feet	
17	Shale, grayish-green, somewhat calcareous, containing a little anhydrite and occasional fine to medium well rounded quartz grains, with a great deal of interbedded brick-red shale	2255 - 2272
77	Shale, brick-red, somewhat calcareous, containing a little anhydrite and occasional fine to medium rounded quartz grains	2272 - 2349
37	Shale, grayish-green, somewhat calcareous, containing a little anhydrite, with a little interbedded very fine, dense, brownish-gray, argillaceous magnesian limestone	2349 - 2386
16	Shale, grayish-green, slightly calcareous, with some interbedded very dark gray slightly calcareous shale	2386 - 2402
208	Shale, brick-red	2402 - 2610
	Pittsford shale, 67 feet	
24	Shale, dark-gray, somewhat calcareous	2610 - 2634
43	Shale, very dark gray, somewhat calcareous	2634 - 2677
	Middle Silurian or Niagaran Series, 397 feet	
	Clinton group, 397 feet	
26	Sandstone, fine- to medium-grained, light-gray to grayish-red, somewhat calcareous, with a little interbedded gray shale—Herkimer	2677 - 2703
8	Shale, greenish-gray	2703 - 2711
24	Siltstone, gray, somewhat calcareous, containing fragments of shells, with a great deal of interbedded dark-gray shale	2711 - 2735

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish-gray, in part silty and slightly calcareous	2735 - 2753
	Top of Westmoreland iron ore	2753
10	Hematite, oolitic, brick-red, sandy and somewhat calcareous, with some interbedded greenish-gray shale--a little salt water at 2753 feet	2753 - 2763
10	Hematite, oolitic, brick-red, sandy and slightly calcareous, with considerable interbedded greenish-gray shale	2763 - 2773
20	Hematite, oolitic, brick-red, sandy and slightly calcareous, with a little interbedded greenish-gray shale--a little salt water at 2793 feet	2773 - 2793
	Bottom of Westmoreland iron ore	2793
9	Shale, greenish-gray	2793 - 2802
10	Siltstone, greenish-gray, slightly calcareous, with considerable interbedded greenish-gray shale	2802 - 2812
11	Shale, greenish-gray, in part silty	2812 - 2823
28	Shale, greenish-gray, with a little interbedded greenish-gray siltstone--2 bailers salt water in 24 hours at 2851 feet	2823 - 2851
15	Shale, greenish-gray	2851 - 2866
17	Shale, greenish-gray, with a little interbedded fine- to medium-grained, greenish-gray argillaceous sandstone	2866 - 2883
6	Shale, greenish-gray, with some interbedded very fine grained greenish-gray argillaceous sandstone	2883 - 2889
16	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	2889 - 2905
34	Shale, greenish to dark greenish gray, with some interbedded fine- to medium-grained greenish- to reddish-gray argillaceous sandstone	2905 - 2939
17	Shale, greenish-gray	2939 - 2956

Thickness Feet	Description of Strata	Depth in feet
42	Sandstone, fine- to medium-grained, dark greenish gray, argillaceous	2956 - 2998
30	Shale, gray, with considerable interbedded medium-grained, light-gray quartzose sandstone—5 bailers of salt water in 12 hours at 3020 feet	2998 - 3028
	Top of Oneida conglomerate	3028
10	Sandstone, medium-grained, light-gray, almost white, quartzose, with considerable interbedded gray shale	3028 - 3038
8	Sandstone, medium-grained, light-gray, almost white, quartzose, with a little interbedded gray shale	3038 - 3046
28	Sandstone, medium- to coarse-grained, conglomeratic, light-gray, almost white	3046 - 3074
	Bottom of Oneida conglomerate	3074
	ORDOVICIAN SYSTEM, 1746 feet	
	Upper Ordovician or Cincinnatian Series, 358 feet	
	Lorraine shale, 358 feet	
70	Shale, dark to very dark gray, in part silty—small show of gas and salt water at 3080 feet	3074 - 3144
48	Shale, very dark gray, with a little interbedded dark-gray siltstone	3144 - 3192
134	Shale, very dark gray, with some interbedded greenish-gray siltstone	3192 - 3326
192	Shale, dark to very dark gray, with some interbedded dark greenish gray siltstone containing some minute muscovite flakes	3326 - 3518
50	Shale, very dark gray, with some interbedded dark-gray silty shale	3518 - 3568
56	Shale, very dark gray, with some interbedded dark-gray silty shale and a little gray siltstone	3568 - 3624
68	Shale, very dark gray, with a little interbedded dark-gray siltstone	3624 - 3692

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
117	Shale, dark to very dark gray, with some interbedded dark-gray siltstone	3692 - 3809
87	Shale, very dark gray, with a little interbedded dark-gray siltstone	3809 - 3896
36	Shale, dark to very dark gray	3896 - 3932
	Middle Ordovician or Champlainian Series, 618 feet	
	Utica shale, 353 feet	
23	Shale, very dark gray to grayish-black	3932 - 3960
42	Shale, grayish-black, slightly calcareous	3960 - 4002
120	Shale, grayish-black, somewhat calcareous	4002 - 4122
163	Shale, grayish-black, calcareous, containing minute shell fragments in lower part	4122 - 4285
	Top Trenton limestone	4285
15	Shale, grayish-black, calcareous, with some interbedded very fine, dense, light-gray, argillaceous limestone	4285 - 4300
1	Bentonite, light-gray, micaceous	4300 - 4301
12	Shale, grayish-black, calcareous, with some interbedded very fine, dense, gray to dark-gray argillaceous limestone, containing some minute shell fragments	4301 - 4313
24	Limestone, very fine, dense, very dark gray, argillaceous, with some interbedded grayish-black calcareous shale	4313 - 4337
47	Shale, grayish-black, calcareous, with some interbedded very fine, dense, dark to very dark gray argillaceous limestone containing occasional fragments of shells	4337 - 4384
36	Shale, grayish-black, calcareous	4384 - 4420
78	Limestone, coarse, clastic, gray to dark-gray, somewhat argillaceous, containing abundant fragments of shells, with a little interbedded grayish-black calcareous shale	4420 - 4498
20	Limestone, very fine, lithographic, brownish-gray, argillaceous	4498 - 4518

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine, lithographic, light gray to gray, somewhat argillaceous	4518 - 4526
24	Limestone, very fine, dense, light-gray, argillaceous	4526 - 4550
	Lower Ordovician or Canadian Series, 270 feet	
	Tribes Hill limestone, 270 feet	
9	Dolomite, very fine to fine, granular, brownish-gray, containing a great deal of light-gray to white subchalcedonic chert	4550 - 4559
6	Limestone, very fine to fine, granular, brownish-gray, dolomitic, containing considerable light-gray to white subchalcedonic chert and a little tripolitic chert	4559 - 4565
25	Limestone, very fine, dense, light brownish gray, dolomitic, containing considerable light-gray to white subchalcedonic chert and some light-gray tripolitic chert	4565 - 4590
4	Limestone, very fine to fine granular, light-gray, dolomitic, silty	4590 - 4594
21	Limestone, very fine, crystalline, light-gray, magnesian, containing a little quartz silt	4594 - 4615
28	Limestone, very fine, crystalline, light brownish gray, magnesian, silty	4615 - 4643
5	Limestone, very fine, crystalline, light brownish gray, magnesian, silty, containing a very little light-gray to white semichalcedonic chert	4643 - 4648
39	Limestone, very fine, crystalline, light-gray, magnesian, silty	4648 - 4687
4	Limestone, very fine, dense, very dark gray, argillaceous	4687 - 4691
19	Limestone, fine, crystalline, light gray, magnesian, somewhat silty, containing considerable white semichalcedonic chert in part drusy--Brackish water at 4693-4696, rose 1000 feet in hole, rose 3400 feet in 24 hours at 4701-4704; show of gas at 4701.	4691 - 4710

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
46	Limestone, very fine to fine, crystalline, light-gray to light brownish gray, somewhat magnesian, and silty, containing a little white semichalcedonic chert	4710 - 4756
39	Limestone, very fine, crystalline, light brownish to brownish gray, magnesian, somewhat silty and sandy--additional brackish water at 4782	4756 - 4795
25	Limestone, very fine, crystalline, light brownish gray, dolomitic, containing considerable very fine to medium grained angular quartz sand--some of quartz grains exhibit secondary crystal faces, a few are rounded and frosted--additional brackish water at 4308	4795 - 4820
	CAMBRIAN SYSTEM,	
	Upper Cambrian Series, 720 feet	
	Little Falls dolomite, 317 feet	
17	Dolomite, very fine, crystalline, containing some very fine to fine angular quartz grains, a few of larger ones rounded and frosted	4820 - 4837
17	Dolomite, very fine, crystalline, light brownish gray, containing a little very fine angular quartz sand	4837 - 4854
14	Dolomite, very fine, crystalline, brownish-gray, somewhat argillaceous, containing some very fine quartz sand and silt	4854 - 4868
7	Dolomite, very fine, crystalline, brownish-gray, somewhat argillaceous, containing considerable very fine, angular, quartz sand and silt	4868 - 4875
23	Dolomite, very fine, crystalline, light brownish gray, containing a little quartz silt	4875 - 4898
21	Dolomite, very fine, crystalline, light brownish gray to brownish-gray, somewhat argillaceous, containing some very fine angular quartz sand and silt	4898 - 4919
29	Dolomite, very fine, crystalline, light brownish gray, slightly argillaceous, containing a little quartz silt	4919 - 4948

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
23	Dolomite, very fine, crystalline, light brownish gray, containing some very fine, angular, quartz sand and silt	4948 - 4971
10	Limestone, very fine to fine, crystalline, light brownish gray, dolomitic, containing considerable very fine, angular quartz sand	4971 - 4981
14	Dolomite, very fine, crystalline, brownish gray, containing some very fine angular, quartz sand	4981 - 4995
6	Dolomite, very fine, crystalline, brownish-gray, containing considerable very fine, angular, quartz sand	4995 - 5001
16	Dolomite, very fine, crystalline, brownish-gray, containing some very fine quartz sand and silt and a little light brownish-gray subchalcedonic chert	5001 - 5017
14	Dolomite, very fine, crystalline, very light to light brownish gray, containing some tripolitic chert and light brownish gray subchalcedonic chert	5017 - 5031
5	Dolomite, very fine, crystalline, very light brownish gray, containing a great deal of very light gray semichalcedonic and tripolitic chert and a few fine to medium rounded and frosted quartz grains	5031 - 5036
25	Dolomite, very fine to fine, crystalline, very light brownish-gray, containing some fine to medium rounded and frosted quartz grains and some light-gray tripolitic chert	5036 - 5061
6	Dolomite, very fine to fine, crystalline, very light gray, containing a considerable quantity fine to medium rounded and frosted quartz grains	5061 - 5067
21	Dolomite, very fine to fine, crystalline, very light gray, containing some very fine to fine rounded and frosted quartz grains—brackish water at 5088 feet rose 300 feet	5067 - 5088
18	Limestone, very fine to fine, crystalline, light brownish gray, dolomitic, containing a few very fine to fine rounded and frosted quartz grains	5088 - 5106

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
31	Limestone, very fine, crystalline, light brownish gray, dolomitic, containing some very fine to fine, angular, quartz sand with some of larger grains rounded and frosted, brackish water at 5127 feet, rose 1150 feet in hole	5106 - 5137
	Theresa formation, 365 feet	
4	Sandstone, very fine to fine grained, light brownish gray, dolomitic, with some of larger grains rounded and frosted	5137 - 5141
13	Limestone, very fine to fine, crystalline, brownish-gray, dolomitic, containing considerable very fine angular quartz sand with some of larger grains rounded and frosted	5141 - 5154
21	Limestone, very fine, crystalline, light brownish gray, dolomitic, containing some clay and very fine quartz sand, with some of larger grains rounded and frosted—brackish water at 5165 feet	5154 - 5175
21	Dolomite, very fine, crystalline, brownish-gray, containing some very fine to fine quartz sand with a few of the larger quartz grains rounded and frosted—brackish water at 5180 and 5192 feet	5175 - 5196
13	Dolomite, very fine, crystalline, brownish to dark brownish gray, containing a considerable quantity of fine rounded and frosted quartz grains	5196 - 5209
7	Sandstone, very fine to fine grained, light brownish gray, dolomitic, quartz grains, angular to subangular	5209 - 5216
28	Limestone, very fine, crystalline, light brownish to brownish gray, dolomitic, containing some very fine to fine angular to subangular quartz grains	5216 - 5244
19	Limestone, very fine, crystalline, brownish-gray, dolomitic, containing considerable very fine to fine angular to subangular quartz sand—brackish water at 5246 feet	5244 - 5263
5	Limestone, very fine, dark brownish gray, dolomitic, containing some very fine subangular to subrounded quartz grains	5263 - 5268

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Limestone, very fine, crystalline, dark brownish gray, dolomitic, containing a considerable quantity of fine subrounded and for the most part frosted quartz grains	5268 - 5282
6	Dolomite, very fine, crystalline, dark brownish gray, containing some very fine to fine subangular to subrounded and in part frosted quartz grains	5282 - 5288
39	Dolomite, very fine, crystalline, light brownish to brownish gray, containing a considerable quantity very fine to fine subangular quartz grains	5288 - 5327
9	Dolomite, very fine, crystalline, light brownish gray, containing some very fine to fine subangular to subrounded quartz grains, in part frosted	5327 - 5336
8	Limestone, very fine, crystalline, brownish-gray, dolomitic, containing a little quartz silt and an occasional fine quartz grain	5336 - 5344
11	Limestone, very fine, crystalline, dark brownish gray, dolomitic, containing a little quartz silt and very fine sand	5344 - 5355
53	Dolomite, very fine, crystalline, very light to light brownish gray, containing a few very fine subangular to subrounded quartz grains in part frosted	5355 - 5408
18	Dolomite, very fine, crystalline, brownish-gray, containing a little very fine quartz sand and silt	5408 - 5426
31	Dolomite, very fine, crystalline, light brownish gray, containing a little very fine quartz sand and silt	5426 - 5457
13	Dolomite, very fine to fine, crystalline, light brownish gray, containing some very fine to fine subangular to subrounded quartz grains	5457 - 5470
2	Limestone, very fine, crystalline, light brownish gray, dolomitic, containing a considerable quantity very fine to fine subangular quartz sand with a few grains rounded and frosted	5470 - 5472

Lobdell No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Sandstone, fine- to medium-grained, light brownish gray, quartzose, somewhat dolomitic, quartz grains subangular	5472 - 5483
2	Limestone, very fine, crystalline, light brownish to brownish-gray, dolomitic, containing a large quantity of fine to medium subangular quartz grains and a few subrounded and frosted ones	5483 - 5485
18	Sandstone, fine- to medium-grained, light brownish gray, somewhat dolomitic most of quartz grains subangular, a few subrounded and frosted in basal part	5485 - 5503
	Potsdam sandstone, 37 feet	
4	Sandstone, fine- to medium-grained, light-gray, quartzose, slightly calcareous, quartz grains mostly angular	5503 - 5507
27	Sandstone, fine- to medium-grained, light-gray, quartzitic	5507 - 5534
2	Sandstone, coarse-grained, light-gray, quartzitic, quartz grains, subangular, with a little interbedded bluish-gray claystone	5534 - 5536
4	Sandstone, fine- to medium-grained, light-gray, quartzose, quartz grains, subangular, with a little interbedded bluish-gray claystone	5536 - 5540
	PRE-CAMBRIAN, 161 feet	
90	Granite "wash", composed of boulders of hornblende granite embedded in a matrix of bluish-gray slightly calcareous claystone	5540 - 5630
7	Claystone, light-greenish gray to brownish-red, slightly calcareous, containing considerable quartz silt, some angular quartz grains, partially weathered feldspar grains, and chert granules and pebbles	5630 - 5637
18	Granite, composed chiefly of somewhat weathered orthoclase and perthite, quartz, hornblende and a little biotite	5637 - 5655
46	Granite, composed chiefly of unweathered orthoclase and perthite, quartz, hornblende and a little biotite	5655 - 5701
	TOTAL DEPTH	5701

WELL-SAMPLE RECORD
NO.
42

WELL-SAMPLE RECORD

Warrant 3653, Pennsylvania Game Lands No. 1
Well, Pennsylvania Gas Company

Elk County, Pennsylvania, Highland Township
Hallton Quadrangle: 2.61 miles north of 41° 25' N. Lat. and .57 miles east of 78° 55' W. Long.
Completed: July 19, 1945
Elevation: 1572 feet above sea-level
Total Depth: 7546 feet
Deepest formation: Queenston
Result: Completed as a small gas well at 2485 feet - open flow, 17,500 cubic feet per 24 hours; reservoir pressure 260 pounds after being shut in 48 hours; not shot.
Samples: 0 to 7546 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 353+ feet	
18	Sandstone, greenish-gray, very fine-grained, containing a little muscovite; in part stained yellowish brown by weathering	0 - 18
	Top of Patton shale member	18
17	Sandstone, greenish-gray, very fine-grained, in part stained yellowish brown by weathering; a little interbedded brick-red shale	18 - 35
7	Sandstone, greenish-gray, very fine-grained, containing some muscovite, with considerable interbedded silty, brick-red shale	35 - 42
6	Shale, greenish-gray, sandy, with some interbedded, silty, brick-red shale and a little very fine-grained greenish-gray sandstone	42 - 48

Warrant 3653, No. 1

Thickness Feet	Desoription of Strata	Depth in feet
	Bottom of Patton shale member	48
5	Sandstone, very fine-grained, greenish-gray, with some interbedded dark-gray shale	48 - 53
17	Shale, dark-gray, sandy and silty	53 - 70
4	Sandstone, ooarse-grained, light-gray, containing a few quartz grains to 2 millimeters in diameter, with considerable interbedded sandy, gray shale	70 - 74
4	Shale, greenish-gray, sandy, containing a little muscovite	74 - 78
8	Shale, dark-gray, silty	78 - 86
15	Sandstone, very ooarse-grained, conglomeratic, light-gray, nearly white, with some rounded and a few flat quartz pebbles to 5 millimeters in diameter	86 - 101
16	Sandstone, medium-grained, conglomeratic, light-gray, nearly white, with some rounded quartz grains to 5 millimeters in diameter	101 - 117
10	Shale, dark-gray, silty, with a little interbedded greenish-gray, sandy shale	117 - 127
61	Shale, dark-gray, silty	127 - 188
8	Sandstone, ooarse-grained, conglomeratio, light-gray, with rounded and a few flat quartz pebbles to 5 millimeters in diameter and an occasional jasper pebble	188 - 196
6	Shale, dark-gray, silty	196 - 202
9	Sandstone, ooarse-grained, conglomeratic, light gray, containing flat quartz pebbles to 8 millimeters in diameter, with some interbedded gray silty shale	202 - 211
7	Sandstone, very fine-grained, light-gray, nearly white, hard, slightly calcareous, with a little muscovite	211 - 218
8	Sandstone, very fine- to fine-grained, conglomeratic, light-gray, slightly calcareous, with a few quartz pebbles to 5 millimeters in diameter	218 - 226
5	Sandstone, medium-grained, light-gray, slightly calcareous, containing a little muscovite	226 - 231
5	Sandstone, fine-grained, greenish-gray, somewhat calcareous, containing fragments of shells	231 - 236

Thickness Feet	Description of Strata	Depth in feet
8	Shale, gray, sandy, slightly calcareous	236 - 244
8	Shale, gray, with considerable interbedded greenish-gray siltstone containing minute fragments of plant remains and a little muscovite	244 - 252
23	Shale, dark-gray, with some interbedded very fine-grained, light-gray- to greenish-gray sandstone and a little coarse, light-gray, conglomeratic sandstone	252 - 275
30	Sandstone, fine-grained, light-greenish- to greenish-gray, with considerable interbedded gray shale	275 - 305
15	Sandstone, fine- to medium-grained, light-gray, slightly calcareous, with a little interbedded gray shale	305 - 320
33	Sandstone, fine-grained, light-gray, containing a little muscovite and a few quartz grains to 2 millimeters in diameter	320 - 353
	DEVONIAN SYSTEM, 5327 feet	
	Upper Devonian Series, 4788 feet	
	Conewango group, 525 feet	
	Oswego formation, 191 feet	
11	Sandstone, very fine-grained, greenish-gray, containing a little muscovite, with some interbedded dark-gray shale	353 - 364
7	Sandstone, fine-grained, light-greenish-gray, containing minute fragments of carbonized plant remains and an occasional shell fragment, with a little interbedded gray shale	364 - 371
8	Shale, dark-gray, with considerable interbedded, very fine-grained, light-greenish-gray sandstone containing a little muscovite. 9-5/8" casing set at 379 feet	371 - 379
11	Sandstone, very fine- to fine-grained, greenish-gray, containing a little muscovite	379 - 390

Thickness Feet	Description of Data	Depth in feet
32	Sandstone, very fine- to fine-grained, light-greenish-gray, containing a little muscovite, with a little interbedded gray shale	390 - 422
18	Shale, dark-gray, silty, with some interbedded greenish-gray siltstone	422 - 440
32	Sandstone, very fine-grained, light-greenish-gray, containing a few fragments of carbonized plant remains and a little muscovite, with some interbedded gray to dark-gray shale	440 - 472
40	Shale, dark-gray, with some interbedded very fine-grained, greenish-gray sandstone	472 - 512
32	Shale, dark-gray, with some interbedded greenish-gray sandy shale	512 - 544
	Cattaraugus formation, 334 feet	
70	Shale, brick-red, silty	544 - 614
8	Sandstone, fine-grained, light-greenish-gray, containing a little muscovite	614 - 622
18	Shale, greenish-gray, sandy and silty	622 - 640
10	Shale, gray, with considerable interbedded reddish-gray shale and some greenish-gray, sandy shale	640 - 650
37	Shale, brick-red, silty, with a little interbedded greenish-gray shale	650 - 687
22	Shale, dark brick-red, micaceous and silty	687 - 709
17	Shale, dark-gray, with considerable interbedded very fine-grained, light-gray sandstone containing a few rounded quartz grains to 2 millimeters in diameter	709 - 726
19	Shale, brick-red, in part silty	726 - 745
35	Shale, greenish-gray, sandy and micaceous, with some interbedded brick-red silty shale	745 - 780
10	Shale, reddish-brown, sandy and micaceous, with a little interbedded dark-gray shale	780 - 790

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine-grained, light-greenish-gray, micaceous	790 - 796
10	Sandstone, very fine-grained, greenish-gray, containing some muscovite, with some interbedded purplish-gray shale	796 - 806
34	Shale, dark-gray, with a little interbedded greenish-gray, sandy shale	806 - 840
26	Shale, brick-red, silty, with a little interbedded grayish-green silty shale	840 - 866
12	Shale, dark-brick-red, silty and somewhat micaceous, with some interbedded greenish-gray sandy shale	866 - 878
	Conneaut group, 700 feet	
36	Shale, dark-gray, in part silty	878 - 914
73	Shale, dark-gray, with some interbedded greenish-gray, silty shale and siltstone	914 - 987
	Top of "pink" rock,	987
34	Shale, dark-purplish-gray, silty, with some interbedded dark-gray shale	987 - 1021
27	Shale, dark-gray, with some interbedded greenish-gray, silty shale	1021 - 1048
34	Shale, dark-gray, with a little interbedded dark-purplish-gray shale	1048 - 1082
11	Shale, dark-purplish-gray, with some interbedded dark-gray shale and a little greenish-gray siltstone	1082 - 1093
20	Shale, dark-greenish-gray, silty, with considerable interbedded dark-gray shale and some dark-purplish-gray shale	1093 - 1113
7	Shale, greenish-gray, silty, containing occasional fragments of shells	1113 - 1120
9	Shale, gray to dark-gray	1120 - 1129
22	Shale, greenish-gray, silty, with some interbedded dark-gray shale	1129 - 1151

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Thickness Feet	Description of Strata	Depth in feet
19	Shale, dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	1151 - 1170
19	Shale, dark-purplish-gray, in part silty, with some interbedded dark-gray shale and a little greenish-gray siltstone containing fragments of shells	1170 - 1189
32	Shale, dark-gray, in part silty, with some interbedded light-greenish-gray siltstone containing some muscovite and fragments of shells	1189 - 1221
37	Shale, dark-purplish-gray, with some interbedded greenish-gray silty shale and siltstone, containing occasional fragments of shells	1221 - 1258
23	Shale, dark-purplish-gray, with considerable interbedded dark-gray shale	1258 - 1281
26	Shale, dark-purplish-gray, in part silty, with some interbedded greenish-gray silstone	1281 - 1307
16	Shale, dark-purplish-gray, in part silty, with some interbedded dark-gray shale	1307 - 1323
	Bottom of "pink" rock	1323
17	Shale, greenish-gray, silty, containing fragments of shells and some muscovite	1323 - 1340
65	Shale, gray to dark-gray, with a little interbedded greenish-gray silty shale and siltstone	1340 - 1405
15	Sandstone, very fine-grained, light-greenish-gray, with some interbedded gray shale	1405 - 1420
109	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	1420 - 1529
13	Shale, dark-gray, with considerable interbedded very fine-grained, light-greenish-gray sandstone containing abundant fragments of shells	1529 - 1542
12	Shale, gray to dark-gray	1542 - 1554
	Top of Bradford First sand	1554
13	Sandstone, very fine-grained, light-greenish-gray, containing occasional quartz grains to 2 millimeters in diameter and some muscovite, with some interbedded gray shale	1554 - 1567

Thickness Feet	Description of Strata	Depth in feet
11	Sandstone, very fine-grained, light-greenish-gray, with considerable interbedded gray shale	1567 - 1578
	Top of Canadaway group	1578
48	Shale, gray to dark-gray	1578 - 1626
5	Sandstone, very fine-grained, light-greenish-gray	1626 - 1631
32	Sandstone, very fine-grained, light-brownish-gray, containing some biotite and muscovite, with some interbedded very fine-grained, light-greenish-gray sandstone and some gray shale	1631 - 1663
45	Shale, gray	1663 - 1708
7	Sandstone, very fine-grained, light-greenish-gray, containing some biotite and muscovite	1708 - 1715
19	Shale, gray, with considerable interbedded very fine grained, light-greenish-gray sandstone, containing a little biotite and muscovite	1715 - 1734
11	Sandstone, very fine-grained, light-greenish-gray, containing an occasional quartz grain up to one millemeter in diameter, with some interbedded gray shale	1734 - 1745
75	Shale, gray	1745 - 1820
41	Shale, gray, with some interbedded greenish-gray siltstone	1820 - 1861
28	Shale, gray to dark-gray, with considerable interbedded greenish-gray silty shale and siltstone containing fragments of shells	1861 - 1889
7	Sandstone, very fine grained, light-greenish-gray, somewhat calcareous and containing fragments of shells, with considerable interbedded gray shale	1889 - 1896
15	Shale, gray to dark-gray	1896 - 1911
38	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone, containing fragments of shells	1911 - 1949
37	Shale, dark-gray	1949 - 1986
13	Shale, gray to dark-gray, with considerable interbedded grayish-brown siltstone containing some biotite and muscovite. 10,000 cubic feet gas at 1990 feet	1986 - 1999

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Thickness Feet	Description of Strata	Depth in feet
18	Shale, greenish-gray, silty, somewhat calcareous, and containing fragments of shells, with a great deal of interbedded dark-gray shale	1999 - 2017
8	Siltstone, grayish-brown, slightly calcareous, with some interbedded greenish-gray silty shale and a very little very dark-gray shale	2017 - 2025
10	Shale, gray, with considerable interbedded grayish-brown siltstone, slightly calcareous and containing fragments of shells. 22,000 cubic feet of gas at 2035 feet.	2025 - 2035
7	Shale, gray, with considerable interbedded greenish-gray siltstone containing fragments of shells	2035 - 2042
84	Shale, gray to dark-gray, with some interbedded light-gray to greenish-gray siltstone, containing fragments of shells	2042 - 2126
20	Shale, gray, silty, containing fragments of shells, with some interbedded dark-gray shale	2126 - 2146
23	Shale, gray to dark-gray, with some interbedded gray, silty shale and siltstone containing fragments of shells	2146 - 2169
41	Shale, dark-gray	2169 - 2210
17	Shale, gray, with some interbedded greenish-gray silty shale	2210 - 2227
11	Shale, gray, with some interbedded dark-brownish-gray siltstone containing some biotite and muscovite	2227 - 2238
8	Shale, gray to dark-gray	2238 - 2246
7	Shale, dark-gray, with considerable interbedded dark-brownish-gray siltstone containing some biotite and muscovite	2246 - 2253
31	Shale, dark-gray, with a little interbedded light-greenish-gray siltstone	2253 - 2284
11	Shale, dark-gray, with some interbedded dark-brownish-gray siltstone, containing some biotite and muscovite. 29,000 cubic feet of gas at 2284 feet.	2284 - 2295
9	Shale, dark-gray, with a little interbedded dark-brownish-gray siltstone and a little medium- to coarse-grained, light-gray sandstone	2295 - 2304

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Thickness Feet	Description of Strata	Depth in feet
6	Siltstone, dark-brownish-gray, containing some biotite and muscovite, with considerable interbedded gray to dark-gray shale	2304 - 2310
5	Sandstone, very fine-grained, dark-chocolate-brown, containing some biotite and muscovite, with some interbedded gray to dark-gray shale. 99,800 cubic feet of gas at 2310 feet.	2310 - 2315
16	Shale, gray	2315 - 2331
9	Shale, gray, with considerable interbedded grayish-brown siltstone containing some biotite and muscovite	2331 - 2340
35	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone, containing an occasional shell fragment	2340 - 2375
18	Siltstone, dark-chocolate-brown, containing some biotite, with some interbedded greenish-gray siltstone and some gray shale	2375 - 2393
15	Shale, gray, with a little interbedded gray siltstone	2393 - 2408
11	Siltstone, dark-chocolate-brown, containing some biotite and muscovite, with some interbedded gray shale. 89,900 cubic feet of gas at 2419 feet.	2408 - 2419
26	Shale, gray, with a little interbedded greenish-gray siltstone	2419 - 2445
18	Shale, gray with a little interbedded grayish-brown siltstone	2445 - 2463
9	Shale, gray, with some interbedded brownish- and greenish-gray siltstone containing an occasional shell fragment	2463 - 2472
52	Shale, dark-gray, with some interbedded greenish-gray siltstone	2472 - 2524
32	Shale, gray to dark-gray	2524 - 2556
132	Shale, gray, with some interbedded greenish-gray siltstone	2556 - 2688
28	Siltstone, dark-brownish-gray, containing some biotite and muscovite, with some interbedded dark-gray shale	2688 - 2716

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Thickness Feet	Description of Strata	Depth in feet
22	Shale, gray to dark-gray, with some interbedded dark-grayish-brown siltstone and some greenish-gray siltstone	2716 - 2738
23	Shale, gray to dark-gray, with a little interbedded greenish-gray siltstone	2738 - 2761
129	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone	2761 - 2890
99	Shale, dark-gray, with considerable interbedded greenish-gray, silty shale	2890 - 2989
44	Shale, greenish-gray, silty, containing some muscovite, with considerable interbedded dark-gray shale	2989 - 3033
10	Shale, gray, silty, in part minutely laminated, containing minute spherical pyrite pellets	3033 - 3043
15	Shale, greenish-gray, silty, containing muscovite, with some interbedded dark-gray shale	3043 - 3058
27	Shale, gray to dark-gray, with some interbedded greenish-gray siltstone, in part minutely laminated, and containing minute spherical pyrite pellets	3058 - 3085
93	Shale, gray to dark-gray, in part finely laminated, with some interbedded greenish-gray, silty shale	3085 - 3178
77	Shale, greenish-gray, silty, with considerable interbedded dark-gray shale	3178 - 3255
25	Shale, dark-gray, in part silty	3255 - 3280
24	Shale, greenish-gray, silty, with some interbedded gray shale	3280 - 3304
19	Shale, gray, with a little interbedded greenish-gray siltstone	3304 - 3323
40	Shale, gray to dark-gray	3323 - 3363
42	Shale, dark-gray, with some interbedded greenish-gray, silty shale	3363 - 3405
88	Shale, light-gray, sandy, in part slightly calcareous and containing some muscovite, with some interbedded gray- to dark-gray shale	3405 - 3493
7	Shale, light-greenish-gray, sandy, with considerable interbedded gray, silty shale	3493 - 3500

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Thickness Feet	Description of Strata	Depth in feet
50	Shale, gray, silty and sandy, containing some muscovite, with some interbedded gray- to dark-gray shale	3500 - 3550
27	Shale, gray, silty and sandy, containing some muscovite, and in part somewhat calcareous	3550 - 3577
9	Shale, light-greenish-gray, sandy, containing some muscovite, with some interbedded dark- to very dark-gray shale	3577 - 3586
31	Shale, light-gray, sandy and silty, containing some muscovite, with some interbedded gray- to dark-gray shale	3586 - 3617
16	Shale, light-gray- to gray, silty and sandy, and in part somewhat calcareous, containing some muscovite, with considerable interbedded gray- to dark-gray shale	3617 - 3633
67	Shale, dark-gray, with some interbedded gray, silty shale	3633 - 3700
8	Shale, dark-gray, with some interbedded gray, silty shale and a little grayish-black shale	3700 - 3708
15	Shale, dark-gray, with some interbedded gray, silty shale	3708 - 3723
14	Shale, gray- to dark-gray, with a little interbedded grayish-black shale	3723 - 3737
8	Shale, gray- to dark-gray	3737 - 3745
17	Shale, greenish-gray, silty, with considerable interbedded gray- to dark-gray shale	3745 - 3762
20	Shale, greenish-gray, silty, with a little interbedded dark- to very dark-gray shale	3762 - 3782
5	Shale, gray, silty, with a little interbedded dark-gray shale	3782 - 3787
10	Shale, gray, in part silty, with a great deal of interbedded very fine-grained, light-gray sandstone, containing a little muscovite	3787 - 3797
8	Sandstone, very fine-grained, light-gray, containing a little muscovite, with a great deal of interbedded gray shale	3797 - 3805

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Thickness Feet	Description of Strata	Depth in feet
9	Shale, gray, in part silty	3805 - 3814
98	Shale, gray, silty and containing some muscovite, with some interbedded gray- to dark-gray shale	3814 - 3912
23	Sandstone, very fine-grained, light-gray, slaty, argillaceous, containing some muscovite, with some interbedded gray shale	3912 - 3935
39	Shale, gray to dark-gray, in part silty	3935 - 3974
43	Shale, gray, silty, with some interbedded dark-gray shale	3974 - 4017
55	Shale, gray- to dark-gray, with some interbedded gray silty shale	4017 - 4072
18	Shale, gray, silty, containing some muscovite, with interbedded dark-gray shale	4072 - 4090
102	Shale, gray- to dark-gray, with some interbedded greenish-gray silty shale	4090 - 4192
9	Shale, gray, silty and sandy, with a little interbedded dark-gray shale	4192 - 4201
16	Sandstone, very fine-grained, greenish-gray, argillaceous, containing some muscovite, with a little interbedded gray- to dark-gray shale	4201 - 4217
7	Shale, greenish-gray, silty and sandy, containing some muscovite, with a little interbedded dark-gray shale	4217 - 4224
12	Shale, gray, in part silty, with a little interbedded very dark-gray silty shale	4224 - 4236
53	Shale, very dark-gray to grayish-black, in part silty, with a little interbedded gray shale	4236 - 4289
8	Shale, dark-gray, with a little interbedded grayish-black shale, and a little greenish-gray siltstone	4289 - 4297
17	Shale, very dark-gray, with considerable interbedded gray- to dark-gray shale, in part silty	4297 - 4314
18	Shale, very dark-gray, to grayish-black, in part silty	4314 - 4332
42	Shale, dark- to very dark-gray, with some interbedded gray shale in part silty	4332 - 4374

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Thickness Feet	Description of Strata	Depth in feet
18	Shale, very dark-gray to grayish-black, with some interbedded gray shale, in part silty	4374 - 4392
26	Shale, gray, in part silty, with considerable interbedded very dark-gray to grayish-black shale	4392 - 4418
70	Shale, very dark-gray to grayish-black	4418 - 4488
20	Shale, dark-gray, finely laminated, sandy, containing some muscovite	4488 - 4508
12	Shale, dark-brownish-gray, finely laminated, sandy, containing some muscovite	4508 - 4520
31	Shale, dark-gray, in part silty	4520 - 4551
38	Shale, very dark-gray to grayish-black	4551 - 4589
9	Shale, dark- to very dark-gray	4589 - 4598
35	Shale, dark- to very dark-gray with a little interbedded grayish-black shale	4598 - 4633
47	Shale, gray to dark-gray, with a little interbedded grayish-black shale	4633 - 4680
15	Shale, very dark-gray, in part minutely laminated	4680 - 4695
80	Shale, dark-gray, with a little interbedded very dark-gray to grayish-black shale	4695 - 4775
72	Shale, dark-gray	4775 - 4847
119	Shale, very dark-gray to grayish-black	4847 - 4966
21	Shale, very dark-gray, with some interbedded dark-brownish-gray shale	4966 - 4987
37	Shale, dark-brownish-gray, in part silty and minutely laminated, with some interbedded very dark-gray shale	4987 - 5024
9	Shale, grayish-black, slightly calcareous	5024 - 5033
18	Shale, very dark-gray, in part silty, somewhat calcareous	5033 - 5051
90	Shale, very dark-gray to grayish-black, somewhat calcareous	5051 - 5141

Thickness Feet	Description of Strata	Depth in feet
	Middle Devonian Series, 461 feet	
	Tully limestone, 31 feet	
23	Limestone, very fine, brownish-gray, somewhat argillaceous	5141 - 5164
8	Limestone, very fine, brownish- to very dark-brownish-gray, somewhat argillaceous, with a little interbedded very dark-gray, calcareous shale	5164 - 5172
	Hamilton group, 374 feet	
49	Shale, dark-gray, calcareous	5172 - 5221
23	Shale, dark- to very dark-gray, in part calcareous	5221 - 5244
7	Shale, very dark-gray, in part slightly calcareous	5244 - 5251
7	Shale, grayish-black, slightly calcareous, with some interbedded dark-gray, slightly calcareous shale	5251 - 5258
13	Shale, very dark-gray, slightly calcareous	5258 - 5271
50	Shale, dark- to very dark-gray, slightly calcareous, with some interbedded grayish-black shale	5271 - 5321
39	Shale, dark-gray, slightly calcareous	5321 - 5360
15	Shale, dark-gray, slightly calcareous, with some interbedded grayish-black shale	5360 - 5375
52	Shale, very dark-gray, somewhat calcareous. Gas pockets at 5386, 5391, 5400, and 5424 feet.	5375 - 5427
6	Shale, very dark-gray, somewhat calcareous, with considerable interbedded grayish-black shale	5427 - 5433
8	Shale, grayish-black. Gas pocket at 5434 feet.	5433 - 5441
20	Shale, very dark-gray to grayish-black, slightly calcareous	5441 - 5461
12	Shale, very dark-gray, slightly calcareous	5461 - 5473
73	Shale, grayish-black, in part somewhat calcareous, containing some minute, finely disseminated pyrite grains	5473 - 5546

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Thickness Feet	Description of Strata	Depth in feet
	Onondaga formation, 56 feet	
1	Bentonite, grayish-brown, containing mica and minute finely disseminated pyrite grains, Tioga	5546 - 5547
13	Shale, very dark-gray, calcareous, with considerable interbedded, very fine, gray limestone, containing fragments of shells	5547 - 5560
2	Limestone, very fine, light-gray- to gray, argillaceous, containing micro-fossil fragments	5560 - 5562
1	Shale, dark-gray, silty, containing abundant glauconite	5562 - 5563
6	Chert, brownish- to dark-brownish-gray, vitreous, with some interbedded dark-gray, in part silty and glauconitic shale	5563 - 5569
9	Shale, dark-gray, with considerable interbedded brownish- to dark-brownish-gray, vitreous chert	5569 - 5578
5	Chert, dark-brownish-gray, vitreous	5578 - 5583
6	Shale, dark-gray, in part silty and glauconitic, with considerable interbedded gray, vitreous chert	5583 - 5589
13	Shale, dark-gray, in part silty and glauconitic, with some interbedded dark-brownish-gray chert and some very fine brownish- to dark-brownish-gray, cherty limestone	5589 - 5602
	Lower Devonian Series, 78 feet	
	Helderberg group, 78 feet	
5	Limestone, dark-brownish-gray, shaly, containing abundant fragments of shells	5602 - 5607
3	Limestone, very fine, dark-brownish-gray, argillaceous and silty, containing abundant fragments of shells	5607 - 5610
24	Limestone, very fine, light-brownish- to brownish-gray, somewhat magnesian, containing a little clay, silt and drusy quartz. 19,000 cubic feet of gas at 5628 feet, and a little saltwater at 5629 feet	5610 - 5634
6	Limestone, very fine, light-brownish gray, with some interbedded dark-gray limestone	5634 - 5640

Thickness Feet	Description of Strata	Depth in feet
21	Limestone, very fine, brownish-gray, somewhat argillaceous	5640 - 5661
9	Limestone, very fine, light- to dark-brownish-gray, very slightly argillaceous	5661 - 5670
10	Limestone, very fine, light-brownish- to brownish-gray, argillaceous and somewhat magnesian	5670 - 5680
	SILURIAN SYSTEM, 1848 feet	
	Upper Silurian or Cayugan Series, 1179 feet	
	Cobleskill limestone, 40 feet	
12	Limestone, very fine, dark- to very dark-brownish-gray, argillaceous and dolomitic, containing considerable light-brownish-gray, vitreous chert and drusy quartz. Gas pockets at 5683 and 5685 feet.	5680 - 5692
7	Limestone, very fine, crystalline, mottled, light-gray and brownish-gray, somewhat argillaceous, containing considerable light-gray to light-brownish-gray chert and occasional fragments of shells	5692 - 5699
7	Limestone, very fine, dark-grayish-brown, argillaceous and dolomitic, containing some brownish-gray chert	5699 - 5706
14	Limestone, very fine, dark-brownish-gray, argillaceous. Gas pocket at 5718 feet.	5706 - 5720
	Salina group, 1139 feet	
	Camillus formation, 774 feet	
19	Limestone, very fine, dark-grayish-brown, somewhat argillaceous, containing a little very fine, crystalline, light-gray anhydrite	5720 - 5739
43	Limestone, very fine, dark- to very dark-brownish-gray, somewhat argillaceous and magnesian, with a great deal of interbedded very fine, crystalline, light-brownish-gray anhydrite	5739 - 5782
52	Limestone, very fine, dark-brownish-gray, argillaceous and somewhat magnesian, with considerable interbedded very fine, crystalline, light-brownish-gray anhydrite. Gas pocket at 5792 feet.	5782 - 5834

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Thickness Feet	Description of Strata	Depth in feet
33	Shale, gray, somewhat dolomitic, containing some anhydrite	5834 - 5867
13	Limestone, very fine, clastic, light-grayish- to grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	5867 - 5880
73	Limestone, very fine, clastic, light-grayish-brown to dark-brownish-gray, argillaceous, in part finely laminated, containing a little anhydrite	5880 - 5953
20	Limestone, very fine, clastic, dark-brownish-gray, argillaceous, containing considerable very fine crystalline, light-gray anhydrite	5953 - 5973
22	Salt, very coarse, crystalline, colorless, with a great deal of interbedded very fine clastic, argillaceous and dolomitic limestone containing some anhydrite	5973 - 5995
7	Limestone, very fine, clastic, dark-brownish-gray, dolomitic and shaly, containing some very fine crystalline anhydrite	5995 - 6002
12	Salt, very coarse, crystalline, light-gray- to colorless, with a great deal of interbedded very fine, clastic, dark-brownish-gray argillaceous and dolomitic limestone	6002 - 6014
17	Limestone, very fine, clastic, brownish-gray- to dark-gray, shaly, containing a little anhydrite, with considerable interbedded very coarse, crystalline, colorless salt	6014 - 6031
7	Limestone, very fine, clastic, brownish- to dark-brownish-gray, argillaceous and dolomitic, containing some very fine-crystalline anhydrite	6031 - 6038
42	Salt, very coarse-crystalline, colorless to light-gray	6038 - 6080
7	Limestone, very fine, clastic, light-brownish-gray, argillaceous and dolomitic, containing considerable very fine, crystalline anhydrite	6080 - 6087
32	Limestone, very fine, clastic, light-brownish-gray, argillaceous and dolomitic, containing some anhydrite, with some interbedded light-greenish-gray somewhat dolomitic shale	6087 - 6119
41	Limestone, very fine, clastic, light- to dark-brownish-gray, argillaceous and dolomitic, containing considerable anhydrite	6119 - 6160

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine, sublithographic, dark-brownish-gray, containing some anhydrite	6160 - 6168
34	Limestone, very fine, clastic, light-brownish-gray, argillaceous and dolomitic, with a little interbedded very fine, clastic, dark-brownish-gray, shaly limestone and some anhydrite	6168 - 6202
37	Salt, very coarse, crystalline, light-gray to colorless	6202 - 6239
78	Limestone, very fine, clastic, dark-brownish-gray, somewhat argillaceous with some interbedded very fine, clastic, light-brownish-gray, somewhat argillaceous and somewhat magnesian limestone and some anhydrite	6239 - 6317
10	Salt, very coarse, crystalline, light-gray to colorless	6317 - 6327
10	Salt, very coarse, crystalline, light-gray- to colorless, with considerable interbedded very fine clastic, brownish-gray, argillaceous and dolomitic limestone	6327 - 6337
17	Salt, very coarse, crystalline, light-gray- to colorless, with some interbedded very fine, clastic, light-brownish-gray, argillaceous and dolomitic limestone	6337 - 6354
19	Shale, brownish-gray, somewhat dolomitic, containing a little anhydrite	6354 - 6373
17	Claystone, brownish-gray, dolomitic, with some interbedded very fine, crystalline anhydrite and some coarse, crystalline, light-gray to colorless salt	6373 - 6390
4	Salt, very coarse, crystalline, light-gray to colorless, with considerable interbedded brownish-gray dolomitic claystone	6390 - 6394
6	Salt, very coarse, crystalline, light-gray to colorless, with some interbedded brownish-gray dolomitic claystone	6394 - 6400
17	Salt, very coarse, crystalline, light-gray- to colorless, with considerable interbedded dark-brownish-gray dolomitic claystone	6400 - 6417
14	Salt, very coarse, crystalline, light-gray- to colorless, with a little interbedded brownish-gray dolomitic claystone	6417 - 6431

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Thickness Feet	Description of Strata	Depth in feet
27	Salt, very coarse, crystalline, light-gray- to colorless, with considerable interbedded very fine, clastic, light-brownish- to dark-brownish argillaceous and dolomitic limestone	6431 - 6458
18	Shale, light-greenish-gray, somewhat dolomitic, containing an occasional rounded and frosted quartz grain up to .7 millimeters in diameter	6458 - 6476
7	Limestone, very fine, clastic, brownish-gray, argillaceous and dolomitic, containing some anhydrite	6476 - 6483
11	Shale, greenish-gray, dolomitic	6483 - 6494
	Vernon shale, 51 feet	
17	Shale, greenish-gray, somewhat dolomitic, with some interbedded variegated greenish- and purplish-gray shale	6494 - 6511
16	Shale, greenish-gray, somewhat dolomitic, with some interbedded dark-gray, somewhat dolomitic shale and a little variegated greenish- and reddish-gray shale	6511 - 6527
10	Shale, gray- to dark-gray, somewhat dolomitic, with some interbedded greenish-gray, somewhat dolomitic shale containing an occasional rounded and frosted quartz grain up to .35 millimeters in diameter	6527 - 6537
8	Shale, gray, somewhat dolomitic, with some interbedded greenish-gray somewhat dolomitic shale and a little variegated greenish- and reddish-gray, somewhat dolomitic shale	6537 - 6545
	Pittsford shale, 314 feet	
9	Shale, gray, somewhat dolomitic, with some interbedded greenish-gray, somewhat dolomitic shale	6545 - 6554
17	Shale, gray- to dark-gray, somewhat dolomitic, containing an occasional rounded and frosted quartz grain .25 to .5 millimeter in diameter and some anhydrite	6554 - 6571
82	Shale, greenish-gray, somewhat dolomitic, with some interbedded dark-gray, somewhat dolomitic shale, containing a little anhydrite	6571 - 6653
6	Shale, dark- to very dark-gray, somewhat dolomitic, with some interbedded greenish-gray somewhat dolomitic shale	6653 - 6659

Thickness Feet	Description of Strata	Depth in feet
32	Shale, brownish- to dark-brownish-gray, dolomitic, containing some anhydrite	6659 - 6691
22	Shale, dark-gray, dolomitic	6691 - 6713
11	Shale, dark-gray, dolomitic, with considerable interbedded brownish-gray dolomitic shale and a little greenish-gray dolomitic shale	6713 - 6724
19	Claystone, light-gray, dolomitic, with a little interbedded dark-brownish-gray dolomitic shale and some anhydrite	6724 - 6743
4	Shale, dark-gray- to dark-brownish-gray	6743 - 6747
9	Limestone, very fine, clastic, dark-grayish-brown, dolomitic, with some interbedded greenish-gray somewhat dolomitic shale and a little anhydrite	6747 - 6756
22	Shale, light-gray- to greenish-gray, dolomitic, with considerable interbedded very fine, clastic, brownish- to dark-brownish-gray argillaceous and dolomitic limestone	6756 - 6778
33	Shale, light-gray, dolomitic, with some interbedded dark-gray dolomitic shale	6778 - 6811
13	Limestone, very fine, clastic, light-brownish-gray, dolomitic, with a little interbedded dark-gray dolomitic shale	6811 - 6824
35	Limestone, in part very fine crystalline, dark-brownish-gray, argillaceous and somewhat magnesian, containing an occasional rounded and frosted quartz grain up to .4 millimeters in diameter and a little anhydrite, with some inberbedded very fine, clastic, argillaceous and dolomitic limestone	6824 - 6859
	Middle Silurian or Niagaran Series,	
	Lockport dolomite, 219 feet	
8	Limestone, very fine, crystalline, dark-brownish-gray, somewhat magnesian, with some interbedded very fine crystalline, light-brownish-gray somewhat magnesian limestone	6859 - 6867
49	Limestone, very fine, clastic, light- to dark-gray, shaly, somewhat magnesian	6867 - 6916
17	Limestone, very fine, clastic, gray- to dark-gray, argillaceous, somewhat magnesian	6916 - 6933

Warrant 3653, No. 1

Thickness Feet	Description of Strata	Depth in feet
22	Limestone, very fine, crystalline, dark-brownish-gray, slightly magnesian	6933 - 6955
9	Shale, dark-brownish-gray, somewhat dolomitic	6955 - 6964
67	Limestone, very fine, crystalline, dark-brownish-gray, dolomitic	6964 - 7031
9	Limestone, very fine, clastic, dark-brownish-gray, shaly, dolomitic, with some interbedded very fine, crystalline, dark-brownish-gray dolomitic limestone	7031 - 7040
21	Limestone, very fine, crystalline, dark-brownish-gray, dolomitic, with a little interbedded dark-brownish-gray somewhat dolomitic shale	7040 - 7061
17	Dolomite, fine, oolitic; oolites brownish-gray in color, imbedded in a light-gray- to white matrix; a few very fine angular quartz grains	7061 - 7078
	Clinton group	
29	Sandstone, very fine-grained, light-gray- to gray, dolomitic	7078 - 7107
13	Shale, gray, slightly dolomitic, with considerable interbedded gray dolomitic siltstone and shale	7107 - 7120
5	Shale, gray, slightly dolomitic, with some interbedded gray, dolomitic siltstone	7120 - 7125
17	Shale, gray, slightly dolomitic, with some interbedded very fine-grained dark-gray dolomitic sandstone	7125 - 7142
31	Shale, dark-gray, with some interbedded very fine-grained, light-gray- to gray somewhat dolomitic sandstone	7142 - 7173
18	Shale, dark-gray, with considerable interbedded very fine-grained, gray, somewhat dolomitic sandstone	7173 - 7191
12	Shale, greenish-gray, with some interbedded dark-gray shale and a little gray somewhat dolomitic siltstone	7191 - 7203
14	Shale, dark-gray- to dark-purplish-gray with a little interbedded greenish-gray shale	7203 - 7217

Thickness Feet	Description of Strata	Depth in feet
22	Shale, dark-purplish-gray with considerable interbedded greenish-gray shale	7217 - 7239
39	Shale, greenish-gray, with some interbedded dark-purplish-gray shale	7239 - 7278
4	Shale, greenish-gray, with a little interbedded gray silty shale	7278 - 7282
15	Shale, greenish-gray, with a little interbedded very fine, crystalline, light-gray, dolomitic limestone	7282 - 7297
50	Shale, greenish-gray, with some interbedded purplish-gray shale	7297 - 7347
8	Shale, greenish-gray, with some interbedded purplish-gray shale and a little very fine-crystalline, gray, dolomitic limestone	7347 - 7355
1	Hematite, red, oolitic	7355 - 7356
7	Shale, purplish-gray, with a little interbedded, greenish-gray shale and a little light-greenish-gray siltstone	7356 - 7363
	Lower Silurian or Albion Series, 165 feet	
	Grimsby member, 24 feet	
2	Shale, brick-red, silty, with some interbedded very fine-grained, light-greenish-gray sandstone	7363 - 7365
5	Shale, brick-red, silty	7365 - 7370
4	Sandstone, very fine-grained, light-pink, with considerable interbedded dark-gray, sandy shale	7370 - 7374
9	Shale, brick-red, sandy	7374 - 7383
4	Shale, greenish-gray, sandy, with a little interbedded brick-red sandy shale	7383 - 7387
	Whirlpool sandstone, 141 feet	
5	Sandstone, very fine-grained, light-gray, almost white, hard	7387 - 7392
9	Shale, gray- to dark-gray, in part silty	7392 - 7401
4	Sandstone, very fine-grained, light-greenish-gray, hard, with a little interbedded gray shale	7401 - 7405

Warrant 3653, No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine-grained, light-greenish-gray, hard, with some interbedded greenish-gray shale	7405 - 7410
6	Sandstone, very fine-grained, light-greenish-gray, hard, with considerable interbedded dark-gray shale	7410 - 7416
8	Sandstone, very fine- to fine-grained, light-greenish-gray, hard, with a little interbedded greenish-gray shale	7416 - 7424
9	Sandstone, fine-grained, light-gray, with a little interbedded greenish-gray shale	7424 - 7433
7	Sandstone, fine-grained, light-gray, hard	7433 - 7440
2	Sandstone, fine- to medium-grained, light-gray, hard, with larger rounded grains	7440 - 7442
4	Sandstone, very fine-grained, light-greenish- to greenish-gray, hard, with some interbedded greenish-gray shale	7442 - 7446
12	Sandstone, fine-grained, light-gray, hard, with a little interbedded greenish-gray shale	7446 - 7458
5	Sandstone, medium-grained, light-gray, hard	7458 - 7463
12	Sandstone, fine- to medium-grained, light-gray, almost white, hard	7463 - 7475
3	Sandstone, very fine- to fine-grained, light-greenish-gray, with some interbedded greenish-gray sandy and silty shale	7475 - 7478
10	Sandstone, fine-grained, light-gray, very hard	7478 - 7488
2	Shale, greenish-gray, sandy, with a little interbedded purplish-gray, silty shale	7488 - 7490
1	Sandstone, very fine-grained, light-greenish-gray	7490 - 7491
2	Shale, purplish-gray	7491 - 7493
6	Sandstone, very fine- to fine-grained, light-gray, almost white	7493 - 7499
5	Shale, gray, with considerable interbedded fine-grained, light-gray sandstone	7499 - 7504
10	Sandstone, very fine-grained, light-gray, with a little interbedded greenish-gray- to dark-gray shale	7504 - 7514

Thickness Feet	Description of Strata	Depth in feet
2	Siltstone, gray	7514 - 7516
8	Shale, dark-gray, with some interbedded very fine-grained, light-gray sandstone	7516 - 7524
4	Sandstone, very fine-grained, light-gray, almost white, hard	7524 - 7528
	ORDOVICIAN SYSTEM, 18+ feet	
	Upper Ordovician or Cincinnatian Series, 18+ feet	
	Queenston shale, 18+ feet	
6	Shale, brick-red, with some interbedded greenish-gray shale	7528 - 7534
12	Shale, brick-red, in part silty	7534 - 7546
	Total Depth	7546

WELL-SAMPLE RECORD

NO.

43

WELL-SAMPLE RECORD

Roy W. Herrington No. 1 Well

New Penn Development Corporation, et al

Steuben County, New York, Town of Woodhull, Woodhull Quadrangle, 1.03 miles south of 42° 5' N. Lat. and .33 mile east of 77° 25' W. Long.
Completed: October 19, 1944
Elevation: 886 feet above sea level
Total Depth: 8625 feet
Deepest formation: Oswego sandstone
Result: 8 M cubic feet of gas per day at 7025 to 7036 feet in Juniata, not increased by shot. 16,750 M cubic feet of gas per day in Oriskany.
Samples: 42 to 8625 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 4078 feet	
	Upper Devonian Series, 3152 feet	
42	No samples	0 - 42
18	Sandstone, very fine-grained, light-greenish-gray, slightly calcareous, containing a little muscovite	42 - 60
8	Siltstone, light-greenish-gray, containing a little muscovite	60 - 68
16	Shale, greenish-gray, silty	68 - 84
26	Sandstone, very fine-grained, light-greenish-gray, slightly calcareous, containing a little muscovite	84 - 110
13	Shale, light-greenish-gray, sandy	110 - 123
20	Sandstone, very fine-grained, light-greenish-gray, slightly calcareous, containing a little muscovite and an occasional shell fragment in lower part	123 - 143

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
29	Siltstone, light-greenish-gray, somewhat calcareous, with an occasional shell fragment in lower part	143 - 172
30	Sandstone, very fine-grained, light-greenish-gray, somewhat calcareous, containing some fragments of shells	172 - 202
43	Shale, gray, silty, containing fragments of shells	202 - 245
10	Siltstone, greenish-gray, slightly calcareous, containing fragments of shells	245 - 255
11	Shale, gray, silty	255 - 266
17	Siltstone, greenish-gray, slightly calcareous, slightly calcareous, containing fragments of shells	266 - 283
12	Siltstone, chocolate-brown and greenish-gray, slightly calcareous, containing a little muscovite and fragments of shells	283 - 295
13	Shale, silty, chocolate-brown and greenish-gray, slightly calcareous, containing fragments of shells	295 - 308
55	Shale, greenish-gray, sandy, containing some muscovite and fragments of shells	308 - 363
45	Shale, gray, silty, containing occasional shell fragments	363 - 408
32	Shale, greenish-gray, sandy, containing fragments of shells	408 - 440
93	Siltstone, grayish-brown, containing some muscovite	440 - 533
107	Shale, gray, with a little interbedded greenish-gray sandy shale	533 - 640
50	Shale, gray to dark-gray, silty	640 - 690
175	No samples, slight show of gas at 738'	690 - 865
10	Shale, grayish-black, in part calcareous	865 - 875
155	No samples, 100 MCF gas at 928'	875 - 1030
10	Siltstone, greenish-gray, containing a little muscovite, with some interbedded gray to dark-gray shale	1030 - 1040
254	No samples	1040 - 1294
16	Shale, gray, silty	1294 - 1310

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
115	Shale, gray to dark-gray, silty	1310 - 1425
40	Shale, dark-gray, with a great deal of interbedded greenish-gray silty shale	1425 - 1465
48	Shale, dark- to very dark-gray, with some interbedded greenish-gray silty shale	1465 - 1513
266	Shale, greenish-gray, silty, containing a little muscovite, with some interbedded dark-gray shale	1513 - 1779
1116	No samples	1779 - 2895
19	Shale, grayish-black, in part slightly calcareous, with some minutely disseminated pyrite	2895 - 2914
233	No samples	2914 - 3147
5	Shale, grayish-black, in part slightly calcareous	3147 - 3152
	Middle Devonian Series, 803 feet	
	Tully limestone, 42 feet	
42	Limestone, very fine, dense, dark-brownish-gray, argillaceous	3152 - 3194
	Hamilton group, 720 feet	
720	No samples	3194 - 3914
	Onondaga limestone, 41 feet	
21	Limestone, very fine, dense, very dark-gray, argillaceous, containing fragments of shells	3914 - 3935
3	Shale, dark- to very dark-gray, somewhat calcareous	
3	Bentonite, light-brownish-gray, in part micaceous, Tioga	3935 - 3938
9	Limestone, dark- to very dark-gray, shaly	3938 - 3947
8	Shale, very dark-gray, slightly calcareous, containing abundant glauconite and some subrounded and frosted quartz grains to 1.5 mm. in diamter	3947 - 3955
	Lower Devonian Series, 134 feet	
	Oriskany sandstone, 23 feet	

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
3	Sandstone, medium-grained, light-gray, quartzose, many quartz grains subrounded and frosted	3955 - 3958
11	Sandstone, fine- to medium-grained, light-gray, quartzose, and only very slightly calcareous, many quartz grains subrounded and frosted	3958 - 3969
3	Sandstone, fine- to medium-grained, light-gray, quartzose and slightly calcareous, many quartz grains subrounded and frosted	3969 - 3972
6	Sandstone, fine-grained, light-brownish-gray, quartzose and somewhat calcareous; quartz grains subangular to subrounded with some grains frosted	3972 - 3978
	Helderberg limestone, 100 feet	
2	Limestone, very fine, dense, light-gray, containing considerable brownish-gray vitreous chert and a little quartz silt, with considerable interbedded dark-gray calcareous shale	3978 - 3980
9	Limestone, fine, crystalline, light-gray to light-brownish-gray, containing a considerable quantity of very fine- to fine, subangular- to subrounded quartz grains, some of which are frosted	3980 - 3989
3	Limestone, fine, crystalline, dark-brownish-gray, containing considerable fine, angular quartz sand, a little vitreous brownish-gray chert, and some fragments of shells	3989 - 3992
14	Limestone, very fine, crystalline, mottled light- and dark-brownish-gray, containing some quartz silt and fragments of shells	3992 - 4006
12	Limestone, very fine, crystalline, gray, containing some very fine quartz sand grains and enhedral quartz crystals and occasional fragments of shells	4006 - 4018
8	Limestone, very fine, crystalline, dark-brownish-gray, containing some quartz silt and fragments of shells	4018 - 4026
8	Limestone, lithographic, very dark-brownish-gray, somewhat argillaceous	4026 - 4034
12	Limestone, very fine, crystalline, dark-gray, somewhat argillaceous, containing some fragments of shells	4034 - 4046

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine, dense, dark-gray, argillaceous	4046 - 4054
24	Limestone, very fine, dense, dark-gray, somewhat argillaceous, containing fragments of shells	4054 - 4078
	SILURIAN SYSTEM, 2883 feet	
	Upper Silurian or Cayugan Series, 2159 feet	
	Cobleskill limestone, 67 feet	
3	Limestone, very fine, dense, light-gray, dolomitic, contains considerable gray clay and quartz silt, and a very little anhydrite	4078 - 4081
15	Limestone, very fine, dense, light-gray, argillaceous and dolomitic	4081 - 4096
15	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic	4096 - 4111
34	Limestone, very fine, dense, dark-gray, somewhat magnesian, argillaceous, containing occasional fragments of shells	4111 - 4145
	Salina group, 2092 feet	
	Camillus formation, 1863 feet	
5	Limestone, very fine, dense, light-gray, argillaceous and dolomitic	4145 - 4150
24	Limestone, very fine, dense, gray, argillaceous and dolomitic, containing considerable interbedded very fine, crystalline, light-gray anhydrite	4150 - 4174
25	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic, containing considerable interbedded very fine, crystalline, light-brownish-gray anhydrite	4174 - 4199
10	Limestone, very fine, dense, dark-gray, shaly and dolomitic, containing a little anhydrite	4199 - 4209
17	Limestone, very fine, dense, dark-brownish-gray, argillaceous and dolomitic, minutely laminated, containing a little anhydrite	4209 - 4226
21	Limestone, very fine, dense, gray, argillaceous and dolomitic, containing a little anhydrite	4226 - 4247
61	Limestone, very fine, clastic, gray to dark-gray, argillaceous and dolomitic, containing a great deal of anhydrite	4247 - 4308

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
21	Limestone, very fine, clastic, light-gray to gray, argillaceous and somewhat magnesian, containing considerable anhydrite	4308 - 4329
68	Salt, coarse, crystalline, light-gray	4329 - 4397
13	Limestone, very fine, clastic, gray, argillaceous and dolomitic, with some interbedded coarse, crystalline, light-gray salt	4397 - 4410
22	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, gray, argillaceous and dolomitic limestone	4410 - 4432
153	Salt, coarse, crystalline, light-gray	4432 - 4585
15	Limestone, very fine, clastic, dark-gray, argillaceous and dolomitic, with considerable interbedded coarse, crystalline, light-gray salt	4585 - 4600
10	Limestone, very fine, clastic, gray, argillaceous and dolomitic, containing considerable anhydrite with a little interbedded coarse, crystalline, light-gray salt	4600 - 4610
20	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, gray, argillaceous and dolomitic limestone	4610 - 4630
20	Salt, coarse, crystalline, light-gray, with a little interbedded very fine, clastic, gray, argillaceous and dolomitic limestone	4630 - 4650
21	Salt, coarse, crystalline, light-gray	4650 - 4671
11	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, light-gray, argillaceous and dolomitic limestone	4671 - 4682
12	Salt, coarse, crystalline, light-gray, with a little interbedded very fine, clastic, light-gray argillaceous and dolomitic limestone	4682 - 4694
14	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, dark-gray shaly dolomite	4694 - 4708
7	Limestone, very fine, clastic, dark-gray, dolomitic and somewhat argillaceous, containing a little anhydrite with some interbedded coarse, crystalline, light-gray salt	4708 - 4715
24	Limestone, very fine, gray, dolomitic and shaly, containing some anhydrite	4715 - 4739

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Limestone, very fine, clastic, brownish-gray, argillaceous and dolomitic, minutely laminated	4739 - 4751
9	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, dark-gray argillaceous and dolomitic limestone	4751 - 4760
10	Limestone, very fine, clastic, brownish- to dark-brownish-gray, dolomitic and shaly, with some interbedded coarse, crystalline, light-gray salt	4760 - 4770
70	Salt, coarse, crystalline, light-gray	4770 - 4840
10	Salt, coarse, crystalline, light-gray, with a little interbedded light-gray, somewhat dolomitic claystone	4840 - 4850
10	Claystone, light-gray, dolomitic, containing considerable anhydrite, with some interbedded coarse, light-gray salt	4850 - 4860
40	Claystone, light-gray to brownish-gray, containing considerable anhydrite	4860 - 4900
20	Limestone, very fine, clastic, brownish-gray, argillaceous and dolomitic, containing considerable anhydrite	4900 - 4920
5	Limestone, very fine, clastic, dark-gray, argillaceous and dolomitic, containing some anhydrite	4920 - 4925
7	Claystone, light-gray, somewhat dolomitic, with some interbedded very fine, clastic, dark-gray, argillaceous limestone	4925 - 4932
12	Limestone, very fine, dense, dark-gray, somewhat argillaceous and magnesian, containing some anhydrite	4932 - 4944
6	Limestone, very fine, crystalline, light-gray, argillaceous and dolomitic, containing a great deal of anhydrite	4944 - 4950
20	Limestone, very fine, crystalline, light-gray, argillaceous and dolomitic, containing a great deal of anhydrite, with some interbedded very fine, dense, dark-gray, somewhat argillaceous and dolomitic limestone	4950 - 4970
42	Limestone, very fine, dense, dark-gray, somewhat argillaceous and dolomitic, with considerable interbedded very fine, crystalline, light-gray argillaceous and dolomitic limestone containing some anhydrite	4970 - 5012

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Limestone, very fine, clastic, light-gray, argillaceous and dolomitic, containing some anhydrite	5012 - 5037
12	Limestone, very fine, dense, dark-gray, argillaceous, with considerable interbedded light-gray dolomitic shale	5037 - 5049
13	Limestone, very fine, dense, dark-gray, somewhat argillaceous and magnesian	5049 - 5062
36	Limestone, very fine, dense, dark-gray, somewhat argillaceous and magnesian, with considerable interbedded very fine, clastic, light-gray, argillaceous and dolomitic limestone containing some anhydrite	5062 - 5098
6	Limestone, very fine, crystalline, light-brownish-gray, argillaceous and dolomitic, containing a great deal of anhydrite, with a little interbedded very fine, dense dark-gray limestone	5098 - 5104
21	Limestone, very fine, clastic, light-gray, argillaceous and dolomitic, containing some anhydrite, with some interbedded very fine, dense, gray limestone and a little coarse, crystalline, light-gray salt	5104 - 5125
55	Claystone, light-gray, somewhat dolomitic, containing an occasional medium to coarse, subrounded quartz grains and some anhydrite	5125 - 5180
40	Limestone, very fine, dense, dark-gray, argillaceous, with some interbedded light-gray, somewhat dolomitic claystone containing some anhydrite	5180 - 5220
10	Limestone, very fine, clastic, dark-gray, argillaceous, with some interbedded light-gray somewhat dolomitic claystone and a little coarse, crystalline salt	5220 - 5230
27	Claystone, light-gray, dolomitic, containing some anhydrite, with some interbedded very fine, dense, dark-gray argillaceous limestone	5230 - 5257
5	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, dense, dark-gray, argillaceous limestone	5257 - 5262
16	Salt, coarse, crystalline, light-gray	5262 - 5278
22	Limestone, very fine, clastic, light-brownish- to dark-gray, minutely laminated, containing some anhydrite	5278 - 5300
20	Limestone, very fine, dense, dark-gray, magnesian and somewhat argillaceous, containing some anhydrite	5300 - 5320

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Limestone, very fine, dense, dark-gray, magnesian and somewhat argillaceous, with some interbedded coarse, crystalline, light-gray salt and a little very fine, clastic, light-brownish-gray argillaceous and dolomitic limestone	5320 - 5345
10	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, dense, dark-gray dolomitic limestone and some very fine, clastic, light-brownish-gray dolomitic limestone	5345 - 5355
30	Salt, coarse, crystalline, light-gray	5355 - 5385
12	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, light-gray, argillaceous and dolomitic limestone	5385 - 5397
40	Salt, coarse, crystalline, light-gray	5397 - 5437
23	Shale, light-gray, dolomitic containing some anhydrite and some interbedded coarse, crystalline, light-gray salt	5437 - 5460
15	Salt, coarse, crystalline, light-gray, with considerable interbedded light-gray dolomitic shale	5460 - 5475
7	Salt, coarse, crystalline, light-gray	5475 - 5482
9	Shale, gray, somewhat dolomitic, with some interbedded coarse, crystalline, light-gray salt	5482 - 5491
6	Salt, coarse, crystalline, light-gray, with some interbedded gray, somewhat dolomitic shale	5491 - 5497
15	Shale, gray, somewhat dolomitic, with considerable interbedded coarse, crystalline, light-gray salt	5497 - 5512
43	Shale, gray to brownish-gray, dolomitic, containing some anhydrite	5512 - 5555
75	Claystone, light-brownish- and greenish-gray, somewhat dolomitic, containing considerable very fine crystalline light-brownish-gray anhydrite	5555 - 5630
125	Claystone, light-greenish-gray, slightly dolomitic	5630 - 5755
25	Claystone, light-greenish-gray, slightly dolomitic, with considerable interbedded very fine, clastic, gray, argillaceous and dolomitic limestone	5755 - 5780
10	Shale, light-purplish-gray, somewhat calcareous, with some interbedded light-greenish-gray, somewhat calcareous claystone	5780 - 5790

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Claystone, light-greenish-gray, slightly dolomitic, with some interbedded very fine, clastic, argillaceous and dolomitic limestone	5790 - 5800
60	Claystone, light-greenish-gray, slightly dolomitic, containing a little anhydrite	5800 - 5860
50	Claystone, light-gray, somewhat dolomitic	5860 - 5910
25	Claystone, light-gray to gray, somewhat dolomitic, with a little interbedded very fine, dense, grayish-brown, argillaceous and dolomitic limestone	5910 - 5935
20	Limestone, very fine, dense, dark-brownish-gray, argillaceous and dolomitic, with some interbedded light-gray, somewhat dolomitic claystone	5935 - 5955
10	Claystone, light-gray, somewhat dolomitic	5955 - 5965
30	Claystone, light-brownish- and greenish-gray, somewhat dolomitic, containing some anhydrite	5965 - 5995
13	Claystone, light-greenish-gray, slightly dolomitic, containing a little anhydrite	5995 - 6008
	Vernon shale, 229 feet	
27	Claystone, brick-red, with some interbedded light-greenish-gray claystone	6008 - 6035
25	Claystone, brick-red	6035 - 6060
20	Claystone, light-greenish-gray, somewhat calcareous, with a little interbedded brick-red claystone	6060 - 6080
28	Claystone, light-greenish-gray. somewhat calcareous	6080 - 6108
7	Claystone, light-greenish-gray, somewhat calcareous, with some interbedded dark-gray, somewhat calcareous shale	6108 - 6115
10	Claystone, light-greenish-gray, somewhat calcareous	6115 - 6125
55	Claystone, brick-red, with some interbedded light-greenish-gray somewhat calcareous claystone	6125 - 6180
57	Claystone, light-greenish-gray, somewhat calcareous	6180 - 6237

hickness Feet	Description of Strata	Depth in feet
	Middle Silurian or Niagaran Series, 656 feet	
	McKenzie formation, 178 feet	
18	Limestone, very fine, clastic, very dark-gray, argillaceous, containing minute fragments of shells, with some interbedded very fine, clastic, light-gray limestone, also containing minute fragments of shells	6237 - 6255
11	Limestone, very fine, clastic, dark-gray, argillaceous, containing ostracods, with a little interbedded very fine-grained, light-gray limestone	6255 - 6266
14	Limestone, very fine, clastic, dark-gray, somewhat argillaceous, containing ostracods	6266 - 6280
9	Limestone, dark- to very dark-gray, magnesian and somewhat argillaceous	6280 - 6289
6	Limestone, dark-gray, shaly and calcareous	6289 - 6295
25	No samples	6295 - 6320
10	Shale, dark- to very dark-gray, calcareous	6320 - 6330
50	Shale, very dark-gray to grayish-black, calcareous	6330 - 6380
20	Limestone, very fine, dense, very dark-gray to grayish-black, shaly	6380 - 6400
10	Limestone, very fine, dense, gray to dark-gray, shaly	6400 - 6410
410	No samples	6410 - 6820
	Top of Clinton group from drillers' log	6415
30	Shale, grayish-purple	6820 - 6850
10	Shale, grayish-purple, with a little interbedded purplish-gray siltstone	6850 - 6860
5	Shale, purplish-gray, with a little interbedded fine-grained, light-gray, slightly calcareous sandstone	6860 - 6865
7	Shale, purplish-gray, with a little interbedded gray shale	6865 - 6872
6	Shale, greenish-gray, with some interbedded dark-gray shale and a little fine- to very fine-grained, light-gray slightly calcareous sandstone	6872 - 6878

Thickness Feet	Description of Strata	Depth in feet
15	Shale, dark-purplish-gray, with some interbedded greenish-gray sandy shale	6878 - 6893
	Lower Silurian or Albion Series, 68 feet	
	Grimsby formation, 57 feet	
7	Siltstone, brick-red, with considerable interbedded dark-gray, shale	6893 - 6900
2	Shale, dark-gray, with some interbedded greenish-gray shale	6900 - 6902
6	Shale, brick-red, silty, with some interbedded dark-gray shale	6902 - 6908
7	Shale, brick-red, silty, with a little interbedded greenish-gray shale	6908 - 6915
5	Shale, brick-red, silty	6915 - 6920
13	Shale, brick-red, silty, with a little interbedded very fine light-gray sandstone	6920 - 6933
7	Shale, brick-red, silty	6933 - 6940
6	Siltstone, brick-red, with a little interbedded very fine-grained, light-gray sandstone and some brick-red silty shale	6940 - 6946
2	Sandstone, very fine-grained, light-greenish-gray, with some interbedded light-gray shale	6946 - 6948
2	Sandstone, very fine-grained, light-greenish-gray, with considerable interbedded brick-red silty shale	6948 - 6950
	Whirlpool sandstone, 11 feet	
11	Sandstone, very fine-grained, light-greenish-gray, with a little interbedded light-gray shale	6950 - 6961
	ORDOVICIAN SYSTEM, 1664 feet	
	Upper Ordovician or Cincinnatian Series, 1664 feet	
	Juniata formation, 976 feet	
15	Shale, brick-red, in part silty	6961 - 6976

hickness Feet	Description of Strata	Depth in feet
8	Shale, brick-red, in part silty, with a little interbedded grayish-green shale and a little very fine-grained, light-gray sandstone	6976 - 6984
6	Shale, brick-red, in part silty	6984 - 6990
5	Shale, brick-red, silty, with some interbedded very fine-grained, brick-red sandstone	6990 - 6995
6	Sandstone, very fine-grained, brick-red, with some interbedded brick-red, silty shale	6995 - 7001
5	Shale, brick-red, in part silty, with some interbedded very fine-grained, brick-red sandstone and a very little very fine-grained, light-gray sandstone	7001 - 7006
8	Sandstone, very fine-grained, brick-red, with some interbedded brick-red shale and a little very fine-grained, light-gray sandstone	7006 - 7014
11	Shale, brick-red, silty, with a little interbedded very fine-grained, brick-red shale	7014 - 7025
3	Sandstone, very fine- to fine-grained, brick-red, with some interbedded red shale — 7,000 cubic feet of gas per day at 7025 feet	7025 - 7028
3	Sandstone, fine-grained, pink, hard	7028 - 7031
11	Sandstone, fine-grained, pink, hard, with some interbedded brick-red shale — 1000 cubic feet of gas at 7036 feet	7031 - 7042
2	Shale, brick-red	7042 - 7044
22	Sandstone, fine-grained, light-pink, moderately hard	7044 - 7066
13	Shale, brick-red, silty, with a little interbedded fine-grained, light-gray sandstone	7066 - 7079
77	Shale, brick-red, silty	7079 - 7156
169	Shale, brick-red, sandy, with a little interbedded brick-red shale	7156 - 7325
7	Shale, grayish-green, with some interbedded brick-red, sandy shale	7325 - 7332
18	Shale, grayish-red, sandy	7332 - 7350
22	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded brick-red shale	7350 - 7372

Herr'ngton No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Shale, grayish-red, sandy, with a little interbedded brick-red shale	7372 - 7383
27	Sandstone, very fine-grained, grayish-red, argillaceous and slightly calcareous, with a little interbedded brick-red shale	7383 - 7410
16	Sandstone, very fine-grained, grayish-red, argillaceous	7410 - 7426
6	Shale, purplish-gray, with some interbedded very fine-grained, greenish-gray sandstone	7426 - 7432
18	Sandstone, very fine-grained, grayish-red, argillaceous and slightly calcareous, with considerable interbedded brick-red shale	7432 - 7450
12	Shale, grayish-green, with some interbedded very fine-grained, reddish-gray, argillaceous sandstone	7450 - 7462
28	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded grayish-green shale	7462 - 7490
10	Shale, brick-red, with some interbedded very fine-grained, greenish-gray, argillaceous sandstone	7490 - 7500
55	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded brick-red shale, and a little greenish-gray shale	7500 - 7555
8	Sandstone, very fine-grained, brick-red, argillaceous, with considerable interbedded brick-red shale and a little greenish-gray shale	7555 - 7563
9	Sandstone, very fine-grained, brick-red, argillaceous, with a little interbedded brick-red shale	7563 - 7572
49	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray shale	7572 - 7621
18	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with some interbedded brick-red shale	7621 - 7639
56	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous and slightly calcareous, with considerable interbedded greenish-gray shale, and a little brick-red shale	7639 - 7695
5	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded brick-red shale	7695 - 7700

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded greenish-gray shale	7700 - 7714
10	Sandstone, very fine-grained, greenish- and reddish-gray	7714 - 7724
7	Sandstone, very fine-grained, greenish-gray, with considerable interbedded brick-red shale	7724 - 7731
12	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with some interbedded brick-red shale	7731 - 7743
4	Shale, greenish-gray, with a great deal of interbedded greenish-gray siltstone	7743 - 7747
9	Shale, brick-red, with a great deal of interbedded very fine-grained, greenish- and reddish-gray, argillaceous sandstone	7747 - 7756
11	Sandstone, very fine-grained, greenish-gray, with considerable interbedded greenish-gray shale, and some brick-red shale	7756 - 7767
21	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded purplish-gray shale	7767 - 7788
6	Shale, gray, with considerable interbedded greenish-gray siltstone	7788 - 7794
43	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded greenish-gray shale	7794 - 7837
26	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray shale	7837 - 7863
15	Sandstone, very fine-grained, greenish-gray, argillaceous, with considerable interbedded brick-red shale	7863 - 7878
5	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded brick-red shale	7878 - 7883
21	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray and brick-red shale	7883 - 7904
14	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	7904 - 7918
19	Sandstone, very fine-grained, greenish and reddish-gray, argillaceous and slightly calcareous, with a little interbedded greenish-gray shale	7918 - 7937

Thickness Feet	Description of Strata	Depth in fee
	Oswego sandstone, 688 feet	
14	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	7937 - 7951
12	Sandstone, very fine-grained, greenish-gray, with considerable interbedded gray shale	7951 - 7963
72	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	7963 - 8035
3	Shale, greenish-gray, sandy	8035 - 8038
35	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	8038 - 8073
4	Shale, gray, with considerable interbedded very fine-grained, greenish-gray, argillaceous sandstone	8073 - 8077
8	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded gray shale	8077 - 8085
3	Shale, greenish-gray, with considerable interbedded, very fine-grained, greenish-gray sandstone	8085 - 8088
14	Sandstone, very fine-grained, greenish-gray, argillaceous, and slightly calcareous	8088 - 8102
17	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded gray shale	8102 - 8119
24	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded gray shale	8119 - 8143
36	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded gray shale	8143 - 8179
29	Sandstone, very fine-grained, greenish-gray, argillaceous	8179 - 8208
25	Sandstone, very fine-grained, light-greenish-gray	8208 - 8233
11	Sandstone, very fine-grained, light-greenish-gray, with some interbedded gray shale	8233 - 8244
19	Sandstone, very fine-grained, light-greenish-gray	8244 - 8263
7	Sandstone, very fine-grained, greenish-gray, argillaceous	8263 - 8270
22	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous, with a little interbedded gray shale	8270 - 8292

ickness Feet	Description of Strata	Depth in feet
23	Sandstone, very fine-grained, greenish-gray, argillaceous and slightly calcareous	8292 - 8315
15	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous	8315 - 8330
15	Sandstone, very fine-grained, greenish-gray, argillaceous and slightly calcareous, with a little interbedded gray shale	8330 - 8345
10	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous and slightly calcareous	8345 - 8355
5	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous and slightly calcareous, with considerable interbedded gray shale	8355 - 8360
26	Sandstone, fine-grained, greenish-gray, argillaceous, with a little interbedded gray shale	8360 - 8386
19	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous and slightly calcareous, with considerable interbedded gray shale	8386 - 8405
35	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous and slightly calcareous	8405 - 8440
5	Shale, gray to dark-gray, with a great deal of interbedded fine-grained, greenish-gray, argillaceous sandstone	8440 - 8445
45	Sandstone, very fine-grained, greenish-gray, argillaceous and slightly calcareous, with a little interbedded gray shale	8445 - 8490
10	Sandstone, fine-grained, greenish-gray, argillaceous	8490 - 8500
15	Sandstone, fine-grained, greenish-gray, argillaceous and slightly calcareous, with a little interbedded greenish-gray shale	8500 - 8515
55	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous, with a little interbedded gray shale	8515 - 8570
5	Shale, gray, with considerable interbedded fine-grained, light-greenish-gray, somewhat argillaceous sandstone	8570 - 8575

Herrington No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous, with a little interbedded gray shale	8575 - 8600
25	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous, with a little interbedded gray shale	8600 - 8625
	TOTAL DEPTH	8625

WELL-SAMPLE RECORD
NO.
44

WELL-SAMPLE RECORD

Ellen Collins No. 1 Well

Godfrey L. Cabot, Inc.

Steuben County, New York, Town of Erwin, Lot No. 8.
Corning Quadrangle, .97 mile north of 42° 10' N. Lat. and 1.38 miles west of 77° 10' W. Long.
Completed: July 16, 1940
Elevation: 1718 feet above sea-level
Total Depth: 6775 feet
Deepest formation: Queenston shale
Result: water at 62 feet, 288 feet and 346 feet in Upper Devonian, filled hole at 346 feet; 2½ bailers of salt water per hour in Oriskany at 3813 feet; 2 bailers of salt water per day at 6666-6725 feet in Whirlpool sandstone.
Samples: 162 to 6775 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 390+feet	
	Upper Devonian Series, 2905+ feet	
162	No samples	0 - 162
18	Sandstone, very fine-grained, light-gray, somewhat argillaceous and calcareous, containing fragments of shells and a little muscovite	162 - 180
59	Shale, gray, in part silty, with some interbedded very fine-grained light-gray sandstone, somewhat calcareous, containing occasional fragments of shells	180 - 239
23	No samples	239 - 262
28	Siltstone, greenish-gray, somewhat calcareous, containing fragments of shells	262 - 290
35	Siltstone, greenish-gray, in part somewhat calcareous, containing fragments of shells, with some interbedded gray, silty shale	290 - 325

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
48	Shale, dark-brownish-gray, in part slightly calcareous, with a great deal of interbedded dark-greenish-gray, in part slightly calcareous shale	325 - 373
10	Shale, greenish- to dark-greenish-gray, silty and somewhat calcareous	373 - 383
7	Sandstone, very fine-grained, light-greenish-gray, containing fragments of shells	383 - 390
55	Siltstone, light-greenish- to greenish-gray, slightly calcareous, containing an occasional shell fragment, with some interbedded dark-greenish-gray silty shale	390 - 445
34	Shale, dark-greenish-gray, in part silty and somewhat calcareous, containing an occasional shell fragment	445 - 479
36	Siltstone, gray to greenish-gray, in part somewhat calcareous, containing fragments of shells	479 - 515
51	Shale, dark-greenish-gray, silty, containing fragments of shells	515 - 566
38	Siltstone, greenish-gray, containing fragments of shells, with some interbedded dark-greenish-gray and brownish-gray, silty shale	566 - 604
27	Shale, dark-brownish- and greenish-gray, silty and in part somewhat calcareous	604 - 631
67	Siltstone, greenish-gray, with considerable interbedded dark-greenish-gray silty shale	631 - 698
42	Siltstone, greenish- to dark-greenish-gray, somewhat calcareous containing occasional fragments of shells	698 - 740
120	Shale, dark-gray, silty	740 - 860
43	Shale, dark-gray	860 - 903
62	Shale, greenish- to dark-greenish-gray, silty, with considerable interbedded dark-gray shale	903 - 965
149	Shale, dark-gray, with some interbedded greenish-gray siltstone containing fragments of shells	965 - 1114
20	Siltstone, greenish-gray, with considerable interbedded, dark-gray shale	1114 - 1134

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
80	Shale, dark-gray, with considerable interbedded greenish- to dark-greenish-gray silty shale	1134 - 1214
42	Shale, dark-gray, with some interbedded greenish-gray siltstone	1214 - 1256
24	Shale, dark-gray, with considerable interbedded gray, silty shale	1256 - 1280
103	Shale, greenish-gray, silty, with some interbedded dark-gray shale	1280 - 1383
229	Shale, gray to dark-gray, in part silty	1383 - 1612
1116	No samples	1613 - 2728
42	Shale, very dark-gray, silty and slightly calcareous	2728 - 2770
59	Shale, very dark-gray to grayish-black, somewhat calcareous and in part silty	2770 - 2829
51	Shale, grayish-black, cut by a few minute, cross-fiber calcite veinlets	2829 - 2880
25	Shale, grayish-black, in part somewhat calcareous	2880 - 2905
	Middle Devonian Series, 892 feet	
	Tully limestone, 67 feet	
31	Limestone, very fine, sublithographic, light-brownish-gray, somewhat argillaceous, containing an occasional shell fragment, with some interbedded grayish-black, in part somewhat calcareous shale	2905 - 2936
16	Limestone, very fine, sublithographic, light- to dark-brownish-gray, somewhat argillaceous	2936 - 2952
20	Limestone, very fine, sublithographic, dark-brownish-gray, somewhat argillaceous and magnesian	2952 - 2972
	Hamilton group, 808 feet	
6	Shale, dark-gray	2972 - 2978
790	No samples	2978 - 3768
12	Shale, very dark-gray, in part somewhat calcareous	3768 - 3780

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 17 feet	
3	Limestone, very fine, dense, very dark-gray, shaly and slightly magnesian, containing fragments of shells	3780 - 3783
1	Bentonite, yellowish-brown, Tioga	3783 - 3784
13	Limestone, very fine, dense, brownish-gray, somewhat argillaceous	3784 - 3797
	Lower Devonian Series, 108 feet	
	Oriskany sandstone, 47 feet	
7	Sandstone, fine- to medium-grained, light-gray, quartzose slightly calcareous, some of large grains subrounded and frosted	3797 - 3804
6	Sandstone, medium-grained, light-gray, quartzose, and very slightly calcareous, some of larger grains subrounded and frosted	3804 - 3810
4	Sandstone, medium- to coarse-grained, light-gray, quartzose, and very slightly calcareous. 2½ bailers of salt water per hour at 3813 feet	3810 - 3814
16	Sandstone, medium-grained, light-gray, quartzose, and very slightly calcareous, some of quartz grains possess secondary crystal faces	3814 - 3830
10	Sandstone, fine- to medium-grained, light-brownish-gray quartzose and somewhat calcareous, some of quartz grains possess secondary crystal faces	3830 - 3840
4	Sandstone, fine- to medium-grained, light-brownish-gray, quartzose and very calcareous	3840 - 3844
	Helderberg limestone, 61 feet	
3	Limestone, very fine, dense, dark-brownish-gray, argillaceous, containing some fine, angular quartz grains and a little dense, light-bluish- and brownish-gray chert	3844 - 3847
3	Limestone, very fine, crystalline, brownish-gray, somewhat argillaceous, containing considerable dense light-brownish-gray chert	3847 - 3850
33	Limestone, very fine, crystalline, light-brownish-gray, somewhat argillaceous, containing some light-brownish-gray, dense chert, and some very fine, light-brownish-gray quartz sand	3850 - 3883

Thickness Feet	Description of Strata	Depth in feet
5	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous, containing fragments of shells	3883 - 3888
17	Limestone, very fine, crystalline, light-brownish-gray, very slightly magnesian, containing a few minute euhedral quartz crystals and crystal clusters	3888 - 3905
	SILURIAN SYSTEM, 2820 feet	
	Upper Silurian or Cayugan Series, 1995 feet	
	Cobleskill limestone, 46 feet	
9	Limestone, very fine, dense, gray, somewhat argillaceous and slightly magnesian	3905 - 3914
33	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous and slightly magnesian, containing occasional fragments of shells	3914 - 3947
4	Limestone, very fine, dense, dark-gray, argillaceous, and somewhat magnesian and silty	3947 - 3951
	Salina group, 1949 feet	
	Camillus formation, 1269 feet	
19	Limestone, very fine, dense, light-gray, dolomitic and somewhat argillaceous, containing considerable anhydrite with considerable interbedded very fine, dense, gray to dark-gray shaly limestone	3951 - 3970
19	Limestone, very fine, dense, light-brownish- to brownish-gray, argillaceous, and somewhat magnesian, containing considerable anhydrite	3970 - 3989
26	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous and magnesian, containing some anhydrite	3989 - 4015
10	Limestone, very fine, dense, dark-brownish-gray, slightly argillaceous and somewhat magnesian, containing a little anhydrite	4015 - 4025
13	Limestone, very fine, dense, light-brownish- to brownish-gray, somewhat argillaceous and slightly magnesian, containing some anhydrite	4025 - 4038
98	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite	4038 - 4136
18	Limestone, very fine, dense, dark-brownish-gray, shaly and somewhat magnesian, containing a little anhydrite	4136 - 4154

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
71	Limestone, very fine, dense, brownish- to dark-brownish-gray, somewhat argillaceous and magnesian, containing considerable anhydrite	4154 - 4225
123	Salt, coarse, crystalline, light-gray	4225 - 4348
12	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, light-grayish-brown, somewhat argillaceous and magnesian limestone	4348 - 4360
73	Salt, coarse, crystalline, light-gray, with a little interbedded very fine clastic, light-grayish-brown, somewhat argillaceous and magnesian limestone	4360 - 4433
19	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, brownish-gray, somewhat argillaceous and magnesian limestone	4433 - 4452
37	Limestone, very fine, dense, grayish-brown, somewhat argillaceous, dolomitic, containing considerable anhydrite and occasional minute euhedral quartz crystals	4452 - 4489
26	Salt, coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, brown- to dark-brown, argillaceous and magnesian limestone	4489 - 4515
37	Limestone, very fine, clastic, grayish-brown, dolomitic, and somewhat argillaceous, containing considerable anhydrite and a few minute euhedral quartz crystals	4515 - 4552
10	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, light-brownish-gray argillaceous and magnesian limestone	4552 - 4562
12	Limestone, very fine, clastic, light- to dark-brownish-gray, argillaceous and magnesian, with some interbedded coarse, crystalline salt and a little anhydrite	4562 - 4574
19	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, light-grayish-brown argillaceous and magnesian limestone	4574 - 4593
21	Salt, coarse, crystalline, light-gray, with a little interbedded very fine, clastic, light-grayish-brown argillaceous and magnesian limestone	4593 - 4614
8	Salt, coarse, crystalline, light-gray	4614 - 4622
9	Salt, coarse, crystalline, light-gray, with a little interbedded very fine, clastic, light- to dark-brownish-gray argillaceous and magnesian limestone	4622 - 4631

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Limestone, very fine, clastic, grayish- to dark-grayish-brown, dolomitic, and somewhat argillaceous, with some interbedded coarse crystalline salt and some anhydrite	4631 - 4641
20	Limestone, very fine, clastic, grayish- to dark-grayish-brown, containing a little anhydrite	4641 - 4661
13	Limestone, very fine, clastic, grayish-brown, somewhat argillaceous and magnesian, containing a little anhydrite and salt, with a little interbedded very dark-gray, slightly dolomitic shale	4661 - 4674
26	Limestone, very fine, clastic, dark-brownish-gray, somewhat argillaceous, with considerable interbedded very fine, crystalline, light-brownish-gray anhydrite and some coarse crystalline light-gray salt	4674 - 4700
127	Salt, coarse, crystalline, light-gray	4700 - 4827
11	Salt, coarse, crystalline, light-gray, with some interbedded very fine, clastic, brownish-gray magnesian limestone and some very fine, crystalline, light-brownish-gray anhydrite	4827 - 4838
24	Limestone, very fine, clastic, light-brownish-gray, argillaceous and somewhat magnesian, with considerable interbedded anhydrite and some salt	4838 - 4862
35	Limestone, very fine, clastic, brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite and a little salt	4862 - 4897
55	Limestone, very fine, clastic, brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite and some salt	4897 - 4952
9	Salt, medium- to coarse-crystalline, light-gray, with considerable interbedded very fine, clastic, dark-brownish-gray limestone and some very fine light-grayish-brown claystone	4952 - 4961
15	Claystone, grayish-brown, dolomitic, with some interbedded very fine, clastic, dark-brownish-gray limestone and some medium- to coarse-crystalline, light-gray salt	4961 - 4976
34	Limestone, very fine, clastic, grayish-brown, dolomitic and slightly argillaceous, containing a little anhydrite	4976 - 5010
17	Salt, very coarse, crystalline, light-gray, with considerable interbedded very fine, clastic, light- to dark-brownish-gray argillaceous and dolomitic limestone	5010 - 5027

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
13	Salt, very coarse, crystalline, light-gray, with considerable interbedded light-brownish-gray claystone and a little very fine, crystalline, light-gray anhydrite	5027 - 5040
10	Claystone, light-brownish-gray, dolomitic, containing a few minute euhedral quartz crystals, with some interbedded very coarse, crystalline salt and a little very fine-crystalline, light-gray anhydrite	5040 - 5050
20	Salt, very coarse, crystalline, light-gray, with a great deal of interbedded light-brownish-gray dolomitic claystone	5050 - 5070
38	Salt, medium to very coarse, crystalline, light-gray	5070 - 5108
8	Limestone, very fine, clastic, light- to dark-brownish-gray, dolomitic and shaly, with considerable interbedded very coarse, crystalline salt and some very fine crystalline light-brownish-gray anhydrite	5108 - 5116
29	Salt, very coarse, crystalline, light-gray, with some interbedded very fine, clastic, brownish-gray argillaceous and dolomitic limestone	5116 - 5145
25	Limestone, very fine, clastic, light-brownish- to brownish-gray, argillaceous and dolomitic, containing some salt and anhydrite	5145 - 5170
14	Limestone, very fine, clastic, light-brownish- to brownish-gray, argillaceous and dolomitic, containing a little anhydrite	5170 - 5184
16	Limestone, very fine, clastic, light-gray to brownish-gray, argillaceous and somewhat magnesian, with some interbedded anhydrite and a little salt	5184 - 5200
20	Limestone, very fine, clastic, brownish-gray, argillaceous and somewhat magnesian, containing a few minute euhedral quartz crystals, with some interbedded greenish-gray somewhat dolomitic shale and a little very fine, crystalline, light-gray anhydrite	5200 - 5220
	Vernon shale, 620 feet	
47	Shale, light-grayish-green, somewhat dolomitic, containing a few medium- to coarse, rounded and frosted quartz grains, with some interbedded light-grayish-red, somewhat dolomitic claystone, and some very fine, crystalline, light-gray anhydrite	5220 - 5267

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
33	Shale, light-grayish-green, somewhat dolomitic, containing a few medium to coarse, rounded and frosted quartz grains, with some interbedded mottled light-greenish and reddish-gray, somewhat dolomitic shale, and a little very fine, clastic, dark-gray, argillaceous limestone and very fine, crystalline, light-gray anhydrite	5267 - 5300
18	Claystone, light-greenish-gray, slightly dolomitic	5300 - 5318
18	Claystone, light-greenish-gray, somewhat dolomitic, with some interbedded very fine, clastic, dark-gray, argillaceous and somewhat dolomitic limestone, and a little very fine, crystalline, light-gray anhydrite	5318 - 5336
16	Claystone, light-greenish-gray, somewhat dolomitic	5336 - 5352
34	Limestone, very fine, clastic, dark-gray, argillaceous and somewhat dolomitic, with considerable interbedded greenish-gray, somewhat dolomitic shale	5352 - 5386
51	Claystone, greenish-gray, somewhat dolomitic, with some interbedded very fine, clastic, dark-gray, argillaceous and somewhat dolomitic limestone	5386 - 5437
7	Limestone, very fine, clastic, dark-gray, argillaceous and somewhat dolomitic	5437 - 5444
14	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite and a few minute euhedral quartz crystals	5444 - 5458
15	Limestone, very fine, clastic, brownish- to dark-brownish-gray, argillaceous and somewhat magnesian, containing a little anhydrite and a few minute quartz crystals, with a little interbedded light-greenish-gray, somewhat dolomitic shale	5458 - 5473
33	Shale, dark-gray, somewhat dolomitic, with some interbedded light-greenish-gray, somewhat dolomitic shale	5473 - 5506
18	Limestone, very fine, clastic, dark-brownish-gray, argillaceous and dolomitic, containing a little anhydrite and a few minute enhedral quartz crystals	5506 - 5524
46	Claystone, light-greenish-gray, somewhat dolomitic, with a little interbedded very fine, clastic, dark-brownish-gray limestone and a little very fine crystalline, light-gray anhydrite	5524 - 5570
12	Shale, light-brownish-gray, somewhat dolomitic, with some interbedded light-greenish-gray somewhat dolomitic claystone and a little very fine crystalline, light-brownish-gray anhydrite	5570 - 5582

Thickness Feet	Description of Strata	Depth in feet
28	Claystone, light-greenish-gray, somewhat dolomitic, with some interbedded variegated light-greenish- and reddish-gray, somewhat dolomitic claystone, and a little anhydrite	5582 - 5610
46	Claystone, variegated, brick-red and light-greenish-gray, slightly calcareous	5610 - 5656
18	Claystone, brick-red, in part slightly calcareous	5656 - 5674
11	Claystone, brick-red, slightly calcareous, with some interbedded light-grayish-green slightly calcareous claystone	5674 - 5685
19	Claystone, light-greenish-gray, slightly calcareous, with some interbedded brick-red, slightly calcareous claystone and some dark-gray, slightly calcareous shale	5685 - 5704
10	Shale, light-grayish-green, somewhat calcareous	5704 - 5714
9	Shale, light-grayish-green, somewhat calcareous, with some interbedded dark-gray, somewhat calcareous shale	5714 - 5723
7	Claystone, light-grayish-green, somewhat dolomitic, with some interbedded brick-red somewhat dolomitic claystone and some dark-gray, somewhat dolomitic shale	5723 - 5730
6	Claystone, light-grayish-green, somewhat dolomitic, with some interbedded dark-gray, somewhat dolomitic shale	5730 - 5736
13	Claystone, light-grayish-green, slightly dolomitic	5736 - 5749
22	Claystone, brick-red, somewhat calcareous with some interbedded light-greenish-gray, slightly calcareous claystone	5749 - 5771
45	Claystone, brick-red, in part somewhat calcareous	5771 - 5816
24	Claystone, light-grayish-green, somewhat calcareous, with some interbedded brick-red somewhat calcareous claystone	5816 - 5840
	Pittsford formation, 60 feet	
40	Shale, light-greenish-gray, somewhat calcareous, with some interbedded gray to dark-gray, somewhat calcareous shale	5840 - 5880
20	Limestone, very fine, clastic, light- to dark-gray, argillaceous, containing some minute euhedral quartz crystals, with some interbedded grayish-green, somewhat calcareous shale	5880 - 5900

Thickness Feet	Description of Strata	Depth in feet
	Middle Silurian or Niagaran Series, 643 feet	
	McKenzie formation, 299 feet	
30	Limestone, very fine, clastic, very dark-gray, argillaceous and somewhat magnesian, with a little interbedded dark-gray, somewhat calcareous shale	5900 - 5930
19	Limestone, very fine, clastic, very dark-gray, argillaceous and somewhat calcareous	5930 - 5949
67	Shale, very dark-gray, very calcareous	5949 - 6016
12	Shale, very dark-gray, calcareous, with some interbedded very fine, clastic, very dark-gray argillaceous limestone	6016 - 6028
34	Limestone, very fine- to fine, clastic, light- to dark-gray, argillaceous, containing fragments of shells	6028 - 6062
17	Shale, gray to dark-gray, somewhat calcareous, containing occasional fragments of shells, with some interbedded very fine, clastic, gray to dark-gray, somewhat silty limestone containing fragments of shells	6062 - 6079
7	Shale, dark-gray, slightly calcareous shale, dark-gray, somewhat calcareous	6079 - 6086
11	Shale, gray to dark-gray, somewhat calcareous, with a little interbedded very fine, clastic, gray limestone	6086 - 6097
29	Shale, dark-gray, slightly calcareous, with some interbedded very fine, clastic, dark-gray, silty limestone containing fragments of shells	6097 - 6126
44	Limestone, very fine to fine, clastic, gray to dark-gray, argillaceous and silty, containing abundant fragments of shells with some interbedded dark-gray somewhat calcareous shale	6126 - 6170
7	Claystone, gray, calcareous, and silty, containing fragments of shells	6170 - 6177
19	Shale, dark-gray, somewhat calcareous, with considerable interbedded fine- to medium-clastic, gray limestone containing abundant fragments of shells	6177 - 6196
3	Limestone, fine to medium, clastic, gray, argillaceous, containing abundant fragments of shells	6196 - 6199

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
	Clinton group, 344 feet	
72	Shale, light-grayish-green, containing an occasional shell fragment	6199 - 6271
8	Claystone, light-grayish-green, very slightly calcareous	6271 - 6279
97	Shale, light-greenish-gray	6279 - 6376
7	Shale, light-greenish-gray, somewhat calcareous	6376 - 6383
14	Shale, light-greenish-gray, with a little interbedded fine to medium, clastic, gray limestone containing fragments of shells	6383 - 6397
19	Shale, light-greenish-gray	6397 - 6416
7	Shale, light-greenish-gray, with a little interbedded fine to medium, clastic, gray limestone containing fragments of shells	6416 - 6423
48	Shale, light-greenish-gray, containing occasional fragments of brachiopod shells	6423 - 6471
3	Claystone, light-greenish-gray	6471 - 6474
10	Shale, light-greenish-gray, containing an occasional fragment of a brachiopod shell	6474 - 6484
29	Shale, light-greenish-gray, with some interbedded dark-gray shale	6484 - 6513
4	Dolomite, very fine, crystalline, light-gray	6513 - 6517
8	Shale, dark-gray	6517 - 6525
8	Siltstone, light-greenish-gray	6525 - 6533
8	Siltstone, light-greenish-gray and pink	6533 - 6541
2	Siltstone, pink	6541 - 6543
	Lower Silurian or Albion Series, 182 feet	
	Grimsby formation, 123 feet	
39	Shale, brick-red, sandy	6543 - 6582
10	Shale, brick-red, sandy, with some interbedded very fine-grained, light-greenish-gray sandstone	6582 - 6592

Collins No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Shale, greenish-gray, sandy, with some interbedded very fine-grained, light-greenish-gray sandstone	6592 - 6603
6	Shale, dark-gray	6603 - 6609
3	Sandstone, very fine-grained, dark-gray	6609 - 6612
21	No samples; 10 M cu. ft. gas, 6618-25	6612 - 6633
3	Shale, brick-red	6633 - 6636
30	No samples	6636 - 6666
	Whirlpool sandstone, 59 feet	
2	Sandstone, fine-grained, light-gray, with considerable interbedded dark-gray shale	6666 - 6668
3	Sandstone, fine-grained, light-gray, with a little interbedded dark-gray shale	6668 - 6671
7	Sandstone, fine-grained, light-gray	6671 - 6678
5	Sandstone, fine- to medium-grained, light-gray	6678 - 6683
1	Shale, very dark-gray	6683 - 6684
9	Sandstone, fine- to medium-grained, light-gray, with some interbedded very dark-gray shale	6684 - 6693
4	Sandstone, fine-grained, light-gray	6693 - 6697
11	Shale, dark-gray, with considerable interbedded, fine-grained, light-gray sandstone	6697 - 6708
7	Siltstone, dark-greenish-gray	6708 - 6715
10	Shale, greenish-gray, with some interbedded dark-gray shale; two barrels salt water per day, interval 6666-6725	6715 - 6725
	ORDOVICIAN SYSTEM, 50+ feet	
	Upper Ordovician or Cincinnatian Series, 50+feet	
	Queenston shale, 50+ feet	6725
11	Shale, brick-red	6725 - 6736
39	Shale, brick-red, mostly sandy	6736 - 6775
	TOTAL DEPTH	6775

WELL-SAMPLE RECORD

NO.

45

WELL-SAMPLE RECORD

FEDERAL LAND BANK WELL
BELMONT QUADRANGLE DRILLING CORPORATION
NEW PENN DEVELOPMENT CORPORATION

Schuyler County, New York, Town of Dix
Watkins Quadrangle: .84 mile south of 42° 20' N. Lat. and 1.62 miles west of 76° 50' W. Long.
Completed: 1937
Elevation: 1206 feet above sea-level
Total Depth: 6600 feet
Deepest formation: Oswego sandstone
Result: No sandstone at Oriskany horizon. Dry in deeper sands
Samples: 2202 to 6600 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
2202	No samples From drillers' log Tully limestone Onondaga Limestone	0 - 2202 920 - 973 2009 - 2080 ?
	SILURIAN SYSTEM, 3096 feet	
	Upper Silurian or Cayugan Series, 2500+ feet	
	Cobleskill Limestone, 123+ feet	
43	Limestone, very fine, dense, gray to dark-gray, shaly and somewhat magnesian, containing occasional fragments of shells	2202 - 2245
21	Limestone, very fine, dense, light-gray to gray, argillaceous and dolomitic	2245 - 2266
17	Limestone, very fine, dense, dark-gray, shaly, and dolomitic, containing a little anhydrite	2266 - 2283

Thickness Feet	Description of Strata	Depth in feet
42	Limestone, very fine, dense, dark-gray, shaly, and slightly magnesian, containing occasional shell fragments	2283 - 2325
	Salina group, 2457 feet	
	Camillus formation, 1965 feet	
22	Limestone, very fine, dense, gray, argillaceous, and somewhat magnesian, containing some very fine, crystaline, gray anhydrite	2325 -2347
54	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing a great deal of very fine, crystalline, anhydrite	2347 - 2401
12	Dolomite, very fine, crystalline, brownish-gray, somewhat argillaceous	2401 - 2413
20	Limestone, very fine, dense, brownish-gray to dark-gray, argillaceous and somewhat magnesian, containing a little anhydrite	2413 - 2433
67	Limestone, very fine, dense, brownish-gray to dark-gray, argillaceous and somewhat magnesian, containing a little anhydrite	2433 - 2500
12	Limestone, very fine, dense, gray, argillaceous, containing an occasional fine to medium, subrounded and frosted quartz grain	2500 - 2512
12	Salt, coarse, crystalline, light gray to colorless, with a great deal of interbedded, very fine, dense, gray, argillaceous and magnesian limestone	2512 - 2524
22	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded very fine dense gray argillaceous and magnesian limestone	2524 - 2546
135	Salt, coarse, crystalline, light-gray to colorless	2546 - 2681
14	Limestone, very fine, dense, brownish-gray, argillaceous and somewhat magnesian, containing considerable very fine crystalline anhydrite and some coarse-crystalline light-gray to colorless salt	2681 - 2695
9	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine, dense, brownish-gray, argillaceous and magnesian limestone	2695 - 2704

Thickness Feet	Description of Strata	Depth in feet
373	Salt, coarse, crystalline, light-gray to colorless	2704 - 3077
41	Limestone, very fine, dense, gray, argillaceous and magnesian, with a little interbedded very fine crystalline brownish-gray anhydrite	3077 - 3118
46	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded very fine, dense, dark-gray, argillaceous and magnesian limestone	3118 - 3164
72	Salt, coarse, crystalline, light-gray to colorless	3164 - 3236
31	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine dense, gray argillaceous and magnesian limestone	3236 - 3267
15	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded very fine, dense, dark-gray, argillaceous and magnesian limestone	3267 - 3282
73	Limestone, very fine, dense, dark-gray, argillaceous	3282 - 3355
42	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded very fine, dense, dark-gray, argillaceous limestone	3355 - 3397
13	Limestone, very fine, dense, brownish to dark brownish gray, argillaceous and dolomitic, containing some anhydrite	3397 - 3410
12	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine, dense, brownish to dark brownish gray, argillaceous limestone	3410 - 3422
23	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic, containing considerable anhydrite	3422 - 3445
30	Salt, coarse, crystalline, light-gray to colorless, with some interbedded very fine, dense, dark-gray, argillaceous and dolomitic limestone	3445 - 3475
29	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded very fine, dense, dark-gray, argillaceous and dolomitic limestone	3475 - 3504
36	Salt, coarse, crystalline, light-gray to colorless	3504 - 3540
34	Clay, gray, somewhat calcareous, containing some anhydrite	3040 - 3574

Federal Land Bank

Thickness Feet	Description of Strata	Depth in feet
30	Limestone, very fine, dense, gray, argillaceous, containing considerable anhydrite	3574 - 3604
40	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic	3604 - 3644
15	Limestone, very fine, dense, brownish-gray, argillaceous, with a little interbedded coarse, crystalline, light-gray to colorless salt	3644 - 3659
58	Limestone, very fine, dense, brownish-gray, argillaceous	3659 - 3717
13	Salt, coarse, crystalline, light-gray to colorless, with considerable interbedded very fine, dense, brownish-gray, argillaceous limestone	3717 - 3730
12	Salt, coarse, crystalline, light-gray to colorless, with some interbedded light-gray somewhat calcareous clay	3730 - 3742
33	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded light-gray somewhat calcareous clay	3742 - 3775
36	Salt, coarse, crystalline, light-gray to colorless, with some interbedded light-gray somewhat calcareous clay	3775 - 3811
17	Salt, coarse, crystalline, light-gray to colorless, with a little interbedded light-gray to brownish-gray, somewhat calcareous clay	3811 - 3828
21	Clay, brownish-gray, somewhat dolomitic	3828 - 3849
20	Salt, coarse, crystalline, light-gray to colorless, with considerable interbedded gray, somewhat calcareous clay	3849 - 3869
9	Shale, gray, somewhat dolomitic, with considerable interbedded light-gray slightly dolomitic clay	3869 - 3878
15	Clay, light-gray, slightly dolomitic, with some interbedded very fine dense brownish-gray argillaceous limestone	3878 - 3893
28	Shale, gray, somewhat dolomitic and containing a little anhydrite, with some interbedded light-greenish-gray, slightly dolomitic clay	3893 - 3921
118	Clay, light-greenish-gray, slightly dolomitic, containing a little anhydrite and an occasional fine to medium, subrounded and frosted quartz grain	3921 - 4039

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Thickness Feet	Description of Strata	Depth in feet
15	Clay, light-greenish-gray, slightly dolomitic, with considerable interbedded gray slightly dolomitic shale	4039 - 4054
35	Clay, light-greenish-gray, slightly dolomitic, containing a little anhydrite	4054 - 4089
11	Shale, gray, with some interbedded light-greenish-gray clay and a little fine crystalline light-gray anhydrite	4089 - 4100
18	Shale, dark-gray, somewhat dolomitic	4100 - 4118
16	Clay, light-greenish-gray, slightly calcareous, containing a little anhydrite	4118 - 4134
20	Clay, light-greenish-gray, slightly calcareous, containing a little anhydrite, with considerable interbedded gray, slightly calcareous shale	4134 - 4154
76	Shale, gray, somewhat clacareous, with considerable interbedded light-greenish-gray somewhat calcareous clay containing an occasional medium-rounded and frosted quartz grain	4154 - 4230
29	Shale, gray, slightly calcareous, with some interbedded light-greenish-gray clay containing a little anhydrite	4230 - 4259
5	Clay, light-greenish-gray, slightly calcareous, containing a little anhydrite	4259 - 4264
15	Shale, gray, somewhat clacareous, with considerable interbedded light-greenish-gray, somewhat calcareous clay containing some anhydrite	4264 - 4279
6	Shale, light-buff, somewhat dolomitic	4279 - 4285
5	Clay, greenish-gray, slightly calcareous	4285 - 4290
	Vernon shale, 344 feet	
7	Clay, reddish-gray, slightly calcareous, with some interbedded gray, somewhat calcareous shale	4290 - 4297
9	Clay, purplish-red, slightly calcareous, with some interbedded greenish-gray, slightly calcareous clay	4297 - 4306

Federal Land Bank

Thickness Feet	Description of Strata	Depth in feet
37	Clay, variegated, purplish-red and greenish-gray	4306 - 4343
67	Clay, purplish-red	4343 - 4410
13	Clay, purplish-red, slightly calcareous, with a little interbedded greenish-gray, slightly calcareous clay	4410 - 4423
45	Shale, purplish-red, slightly calcareous with a little interbedded greenish-gray shale	4423 - 4468
64	Shale, purplish-red, slightly calcareous, with a little interbedded greenish-gray, slightly calcareous shale	4468 - 4532
11	Shale, purplish-red, slightly calcareous, with considerable interbedded light-greenish-gray slightly calcareous light-greenish-gray shale	4532 - 4543
14	Shale, light greenish-gray, somewhat calcareous	4543 - 4557
12	Shale, light-greenish-gray, slightly calcareous with considerable interbedded purplish-red slightly calcareous shale	4557 - 4569
17	Shale, light-greenish-gray, slightly calcareous, with a little interbedded purplish-red shale	4569 - 4586
6	Shale, light-greenish-gray, with considerable interbedded purplish-red shale	4586 - 4592
14	Shale, purplish-red, slightly calcareous, with considerable interbedded light-greenish-gray, slightly calcareous shale	4592 - 4606
28	Shale, light-greenish-gray, slightly calcareous with some interbedded purplish-gray, slightly calcareous shale	4606 - 4634
	Pittsford shale, 148 feet	
14	Shale, dark gray, somewhat calcareous	4634 - 4648
23	Shale, dark gray, calcareous	4648 - 4671
111	Shale, dark to very dark-gray	4671 - 4782

Thickness Feet	Description of Strata	Depth in feet
	Middle Silurian or Niagaran Series, 516 feet	
	McKenzie formation, 149 feet	
15	Shale, dark- to very dark-gray, calcareous, with a little interbedded very fine-grained, dark-gray, dolomitic siltstone	4782 - 4797
28	Shale, dark-gray, calcareous, containing fragments of shells	4797 - 4825
42	Shale, dark-gray, calcareous, with a little interbedded very fine, crystalline, dark-gray limestone, containing fragments of shells	4825 - 4867
23	Shale, gray to dark-gray, somewhat calcareous, and in part silty, containing fragments of shells	4867 - 4890
41	Shale, gray, somewhat calcareous, with some interbedded very fine crystalline, gray, silty limestone containing abundant fragments of shells	4890 - 4931
	Clinton group, 367 feet	
35	Shale, light-greenish-gray	4931 - 4966
17	Shale, light-greenish-gray, with a little interbedded, light-gray, somewhat calcareous siltstone	4966 - 4983
19	Shale, light-greenish-gray, with a little very fine-crystalline, gray limestone containing fragments of shells	4983 - 5002
166	Shale, light-greenish-gray, containing an occasional shell fragment	5002 - 5168
5	Limestone, fine, crystalline, mottled light-gray to reddish-brown, silty and somewhat magnesian	5168 - 5173
5	Limestone, fine, crystalline, mottled light-gray to reddish-brown, silty and somewhat magnesian, with considerable interbedded light-greenish-gray shale	5173 - 5178
36	Shale, light-greenish-gray	5178 - 5214
13	Shale, gray to purplish-gray, slightly calcareous, with considerable interbedded light-greenish-gray shale	5214 - 5227

Thickness Feet	Description of Strata	Depth in feet
26	Shale, gray to purplish-gray, with some interbedded light-greenish-gray shale and a little fine-crystalline, greenish-gray limestone containing an occasional shell fragment	5227 - 5253
14	Shale, gray, with a little interbedded greenish-gray, slightly calcareous siltstone	5253 - 5267
9	Shale, dark-gray, with some interbedded light-greenish-gray shale and a little fine-crystalline, light-gray to gray limestone	5267 - 5276
7	Shale, dark-gray, with some interbedded fine-crystalline mottled, light-gray to reddish-brown limestone containing hemotite	5276 - 5283
15	Shale, gray to greenish-gray, in part silty, with a little interbedded light-greenish-gray slightly calcareous siltstone	5283 - 5298
	ORDOVICIAN SYSTEM, 1302+ feet	
	Upper Ordovician or Cincinnatian Series, 1302+ feet	
	Juniata formation, 999 feet	
6	Shale, brick-red, silty, with some interbedded gray shale	5298 - 5304
15	Shale, brick-red, silty, with some interbedded dark-gray shale	5304 - 5319
77	Shale, brick-red, silty	5319 - 5396
13	Shale, brick-red, silty, with some interbedded greenish-gray shale and light-greenish-gray to pink sandstone	5396 - 5409
3	Sandstone, very fine-grained, light-gray, hard, with some interbedded brick-red silty shale	5409 - 5412
4	Shale, brick-red, silty	5412 - 5416
17	Shale, dark-brick-red, with some interbedded greenish-gray shale	5416 - 5433
8	Shale, dark-brick-red, silty	5433 - 5441
7	Sandstone, very fine-grained, light-gray to pink, hard, with considerable interbedded brick-red silty shale	5441 - 5448

Thickness Feet	Description of Strata	Depth in feet
2	Shale, dark-brick-red, silty	5448 - 5450
4	Siltstone, greenish-gray, with some interbedded greenish-gray shale	5450 - 5454
6	Sandstone, very fine- to fine-grained, light-greenish-gray to pink, hard	5454 - 5460
10	Sandstone, fine-grained, light-gray to pink, hard, with a little interbedded brick-red silty shale and a little grayish-green shale	5460 - 5470
12	Sandstone, fine-grained, light-gray to light-pink, hard	5470 - 5482
6	Sandstone, fine-grained, light-gray, hard	5482 - 5488
12	Sandstone, medium-grained, light-gray, hard	5488 - 5500
38	Sandstone, fine- to medium-grained, light-gray, hard	5500 - 5538
8	Sandstone, fine- to medium-grained, light-gray to light-pink, hard	5538 - 5546
11	Sandstone, very fine-grained, purplish-red, argillaceous	5546 - 5557
8	Sandstone, very fine- to fine-grained, pink, somewhat argillaceous	5557 - 5565
19	Sandstone, very fine-grained, purplish-red, argillaceous	5565 - 5584
18	Sandstone, very fine- to fine-grained, pink, with some interbedded very fine-grained, purplish-red argillaceous sandstone	5584 - 5602
41	Sandstone, very fine-grained, purplish-red, argillaceous, with considerable interbedded brick-red shale	5602 - 5643
12	Sandstone, very fine- to fine-grained, greenish and reddish gray, argillaceous	5643 - 5655
18	Sandstone, very fine- to fine-grained, brick-red to reddish-gray, argillaceous	5655 - 5673
4	Shale, brick-red, sandy	5673 - 5677
14	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, argillaceous	5677 - 5691
32	Sandstone, very fine- to fine-grained, brick-red, argillaceous, with some interbedded brick-red shale	5691 - 5723

Thickness Feet	Description of Strata	Depth in feet
77	Sandstone, very fine- to fine-grained, grayish-red, argillaceous, with a little interbedded brick-red shale	5723 - 5800
37	Sandstone, very fine- to fine-grained, grayish-red, argillaceous, with some interbedded brick-red shale	5800 - 5837
17	Sandstone, fine-grained, greenish and reddish gray, with a little interbedded greenish-gray, silty shale	5837 - 5854
13	Sandstone, very fine-grained, greenish- and reddish-gray with a little interbedded greenish-gray shale	5854 - 5867
20	Sandstone, fine-grained, light-greenish- and reddish-gray, with a little interbedded greenish-gray shale	5867 - 5887
7	Sandstone, very fine-grained, light-greenish-and reddish-gray, argillaceous, with some interbedded greenish-gray, sandy shale	5887 - 5894
5	Shale, greenish-gray, silty, with considerable interbedded very fine-grained, light greenish-gray to pink sandstone	5894 - 5899
20	Sandstone, very fine-grained, light-greenish-gray to light-pink, argillaceous, with a little interbedded greenish-gray, silty shale	5899 - 5919
24	Sandstone, very fine- to fine-grained, pink to reddish-brown, argillaceous, with a little interbedded greenish- and purplish-gray shale	5919 - 5943
21	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray shale	5943 - 5964
35	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray shale	5964 - 5999
18	Sandstone, fine-grained, purplish-gray, argillaceous, with a little interbedded purplish-gray shale	5999 - 6017
8	Sandstone, fine-grained, greenish- and purplish-gray	6017 - 6025
11	Sandstone, fine-grained, reddish-brown, argillaceous, with some interbedded greenish-gray shale, in part sandy	6025 - 6036
24	Sandstone, fine-grained, reddish-gray, argillaceous, with a little interbedded greenish- and purplish-gray shale	6036 - 6060

Thickness Feet	Description of Strata	Depth in feet
39	Sandstone, fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish-gray shale	6060 - 6099
63	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded greenish- and purplish-gray shale	6099 - 6162
26	Sandstone, very fine-grained, reddish-brown, argillaceous, with a little interbedded purplish-red shale	6162 - 6188
42	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, argillaceous	6188 - 6230
4	Shale, reddish-brown, sandy	6230 - 6234
48	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with a little interbedded purplish-red shale	6234 - 6282
15	Sandstone, very fine- to fine-grained, greenish- and reddish-gray	6282 - 6297
	Oswego sandstone, 303+ feet	
29	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	6297 - 6326
13	Sandstone, very fine- to fine-grained, light- greenish-gray, somewhat argillaceous	6 326 - 6339
8	Shale, dark-gray, with considerable interbedded very fine-grained, light-greenish-gray, somewhat argillaceous sandstone	6339 - 6347
22	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded dark-gray shale	6347 - 6369
29	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded dark-gray shale	6369 - 6398
6	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded dark-gray shale	6398 - 6404
10	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous and very slightly calcareous	6404 - 6414

Thickness Feet	Description of Strata	Depth in fee
16	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, and very slightly calcareous, with a little interbedded gray to dark-gray shale	6414 - 643
5	Sandstone, very fine- to fine-grained, greenish- and brownish-gray, argillaceous and very slightly calcareous, with a little interbedded gray shale	6430 - 643
28	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous, with a little interbedded gray to dark-gray shale	6435 - 646
3	Sandstone, very fine- to fine-grained, light-greenish- and reddish-gray, somewhat argillaceous and very slightly calcareous	6463 - 646
14	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous	6466 - 648
8	Sandstone, fine-grained, light-greenish-gray, very slightly calcareous, with a little interbedded gray shale	6480 - 648
13	Sandstone, very fine-grained, greenish-gray, argillaceous	6488 - 650
11	Sandstone, very fine- to fine-grained, light greenish-gray, somewhat argillaceous	6501 - 651
10	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous	6512 - 652
20	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded gray shale	6522 - 654
27	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded gray to dark-gray shale	6542 - 6569
11	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous and very slightly calcareous	6569 - 6580
8	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous and very slightly calcareous, with a little interbedded dark-gray shale	6580 - 6588

hickness Feet	Description of Strata	Depth in feet
8	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous and very slightly calcareous	6588 - 6596
4	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded dark-gray shale	6596 - 6600
	TOTAL DEPTH	6600

WELL-SAMPLE RECORD

NO.

46

WELL-SAMPLE RECORD

J. C. Mahaney No. 1 Well

Reserve Oil Company

Cayuga County, New York, Town of Ledyard, Genoa Quadrangle:
1.31 miles north of 42° 40' N. Lat. and 1.18 miles east of 76° 40' W. Long.
Completed: May 1931
Elevation: 824 feet above sea-level
Total Depth: 6166 feet
Deepest formation: Little Falls dolomite
Result: Hole full of water at 165-172 and 205-215 in the Hamilton group; no oil or gas in the deeper formations, some salt water.
Samples: 1026 to 6156 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 1136+ feet	
1026	No samples	0 - 1026
	Upper Devonian Series, 14+ feet	
	From drillers' log	0 - 14
	Middle Devonian Series, 1051 feet	
	Tully limestone, 21 feet	
	From drillers' log	14 - 35
	Hamilton group, 975 feet	
	From drillers log	35 - 1010

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
	Onondaga limestone, 55 feet	
	Top of Onondaga limestone from drillers' log	1010
14	Limestone, very fine, dense, light-gray to gray, argillaceous, and slightly magnesian containing fragments of shells, with some interbedded grayish-black shale, in part slightly calcareous	1026 - 1040
25	Limestone, very fine, dense, brownish-gray, argillaceous and magnesian, with some interbedded, very dark-gray to grayish-black, slightly calcareous shale	1040 - 1065
	Lower Devonian Series, 71 feet	
	Oriskany sandstone, 21 feet	
8	Sandstone, medium-grained, light-gray, quartzose, and somewhat calcareous with many of quartz grains rounded and frosted	1065 - 1073
5	Sandstone, medium-grained, light-gray, quartzose, and very slightly calcareous, with quartz grains mostly subangular- to angular, some subrounded to rounded and frosted	1073 - 1078
8	Sandstone, medium-grained, light-gray, quartzose and calcareous, with quartz grains mostly subangular to angular, some subrounded to rounded and frosted	1078 - 1086
	Helderberg limestone, 50 feet	
14	Limestone, very fine, dense, very dark-brownish-gray, slightly argillaceous	1086 - 1100
14	Limestone, very fine, dense, light-gray to brownish-gray, slightly argillaceous	1100 - 1114
22	Limestone, very fine, dense, dark-brownish-gray, slightly argillaceous, containing an occasional shell fragment	1114 - 1136
	SILURIAN SYSTEM, 1958 feet	
	Upper Silurian or Cayugan Series, 1548 feet	
	Cobleskill limestone, 38 feet	
13	Limestone, very fine, dense, light-gray, argillaceous, and dolomitic, with a little interbedded very fine, dense, dark-brownish-gray, somewhat argillaceous limestone	1136 - 1149

hickness Feet	Description of Strata	Depth in feet
11	Limestone, very fine, dense, dark-brownish-gray, magnesian and somewhat argillaceous, with considerable interbedded very fine, dense, light-gray, argillaceous and dolomitic limestone	1149 - 1160
14	Limestone, very fine-crystalline, light-gray, argillaceous, silty and dolomitic	1160 - 1174
	Salina group, 1510 feet	
	Camillus formation, 1073 feet	
14	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic, containing a few medium-sized angular quartz grains and a little very fine, crystalline, light-gray anhydrite	1174 - 1188
56	Limestone, very fine, dense, dark-gray, somewhat argillaceous and magnesian	1188 - 1244
23	Limestone, very fine, dense, very dark-gray, argillaceous and dolomitic, containing a great deal of very fine, crystalline, light-gray anhydrite	1244 - 1267
36	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing considerable anhydrite, with a very little interbedded very dark-gray shale	1267 - 1303
21	No samples	1303 - 1324
41	Limestone, very fine, dense to crystalline, dark-brownish-gray, argillaceous and somewhat magnesian, containing a great deal of anhydrite	1324 - 1365
32	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic, containing considerable anhydrite	1365 - 1397
19	Shale, greenish-gray, slightly dolomitic, containing a few rounded and frosted quartz grains, with some interbedded very fine, dense, brownish-gray argillaceous and dolomitic limestone	1397 - 1416
7	Limestone, very fine, crystalline, gray, argillaceous and somewhat magnesian, containing some anhydrite	1416 - 1423
30	Shale, dark-gray, dolomitic, containing some very fine, crystalline, light-gray anhydrite	1423 - 1453
42	Shale, dark-gray, dolomitic, containing a little anhydrite and a few subrounded to rounded and frosted quartz grains	1453 - 1495

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Limestone, very fine, dense, brownish- to dark-brownish-gray, somewhat argillaceous and slightly magnesian, containing some anhydrite, a little gypsum, and a few subrounded to rounded and frosted quartz grains	1495 - 1520
8	Limestone, very fine, shaly, dark-gray, somewhat magnesian, containing some anhydrite and a few fine, subrounded- to rounded and frosted quartz grains	1520 - 1528
87	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite and gypsum	1528 - 1615
9	Salt, medium-crystalline, colorless to white, with some interbedded very fine, dense, brownish-gray argillaceous and somewhat magnesian limestone containing a little gypsum	1615 - 1624
8	Salt, coarse, crystalline, colorless- to white	1624 - 1632
17	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite and a little gypsum	1632 - 1649
15	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite with considerable interbedded coarse-crystalline, colorless salt	1649 - 1664
5	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing a little anhydrite and gypsum	1664 - 1669
18	Salt, coarse-crystalline, colorless to white, with considerable interbedded very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian limestone containing some anhydrite and a little gypsum	1669 - 1687
12	Salt, medium- to coarse-crystalline, colorless to white	1687 - 1699
7	Salt, medium- to coarse-crystalline, colorless to white, with some interbedded very fine, dense, dark-brownish-gray argillaceous and somewhat magnesian limestone	1699 - 1706
26	Salt, medium- to coarse-crystalline, colorless to white	1706 - 1732
3	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing a little gypsum	1732 - 1735

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
50	Clay, gray, magnesian, containing a little anhydrite	1735 - 1785
11	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing a very little gypsum	1785 - 1796
13	Shale, dark-gray, somewhat dolomitic, containing a very little gypsum	1796 - 1809
57	Limestone, very fine, dense, dark-brownish-gray, dolomitic and somewhat argillaceous, containing some gypsum	1809 - 1866
22	Clay, light-gray, slightly dolomitic	1866 - 1888
18	Salt, coarse-crystalline, colorless- to white, with some interbedded very fine, dense, brownish- to dark-brownish-gray argillaceous and somewhat magnesian limestone	1888 - 1906
19	Limestone, very fine, dense, dark-brownish-gray, argillaceous and magnesian, containing a little anhydrite	1906 - 1925
10	Salt, coarse-crystalline, colorless to white, with some interbedded very fine, dense, dark-brownish-gray argillaceous and somewhat magnesian limestone	1925 - 1935
41	Clay, light-greenish-gray, somewhat dolomitic	1935 - 1976
11	Clay, reddish-gray	1976 - 1987
11	Clay, light-greenish-gray, somewhat calcareous	1987 - 1998
10	Siltstone, light-greenish-gray, with considerable interbedded medium-grained light-gray sandstone containing rounded and frosted quartz grains and a little very fine, dense, dark-brownish-gray and somewhat dolomitic limestone	1998 - 2008
7	Clay, grayish-red	2008 - 2015
5	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat dolomitic, containing some medium-well rounded and frosted quartz grains, with some interbedded light-greenish-gray clay	2015 - 2020
20	Clay, light-greenish-gray	2020 - 2040
7	Clay, light-greenish-gray, slightly dolomitic, with some interbedded dark-gray shale	2040 - 2047
101	Clay, light-greenish-gray, slightly dolomitic	2047 - 2148

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine, dense, dark-gray, shaly and somewhat magnesian, containing a little anhydrite	2148 - 2156
9	Clay, light-greenish-gray, slightly dolomitic	2156 - 2165
30	Limestone, gray- to dark-gray, argillaceous and somewhat magnesian, containing a little anhydrite	2165 - 2195
12	Clay, light-greenish-gray, slightly dolomitic	2195 - 2207
40	Limestone, dark-gray, shaly and somewhat magnesian, with a little interbedded light-grayish-green shale	2207 - 2247
	Vernon shale, 279 feet	
29	Clay, grayish-red, slightly dolomitic	2247 - 2276
5	Shale, greenish-gray, slightly dolomitic	2276 - 2281
171	Clay, red, somewhat dolomitic	2281 - 2452
6	Clay, light-greenish-gray, slightly dolomitic	2452 - 2458
56	Clay, red, slightly calcareous	2458 - 2514
12	Clay, light-greenish-gray	2514 - 2526
	Pittsford shale, 158 feet	
22	Shale, dark-gray, silty, dolomitic	2526 - 2548
5	Shale, very dark-gray, slightly dolomitic	2548 - 2553
28	Limestone, very fine, crystalline, very dark-gray, argillaceous and dolomitic	2553 - 2581
5	Shale, dark- to very dark-gray, slightly dolomitic	2581 - 2586
5	Limestone, very fine, crystalline, very dark-gray, argillaceous and dolomitic	2586 - 2591
59	Shale, very dark-gray, calcareous and somewhat magnesian	2591 - 2650
34	Limestone, very fine, dense, very dark-gray, argillaceous and somewhat magnesian, with some interbedded very dark-gray somewhat calcareous shale	2650 - 2684
	Middle Silurian or Niagaran Series, 410 feet	
	McKenzie formation, 151 feet	

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Limestone, very fine, dense to crystalline, gray- to dark-gray, argillaceous, containing fragments of shells with some interbedded dark-gray shale	2684 - 2693
46	Shale, dark-gray, with some interbedded very fine, dense- to crystalline gray limestone containing fragments of shells	2693 - 2739
10	Limestone, very fine, crystalline, dark-gray, silty, containing fragments of shells, with a little interbedded dark-gray shale	2739 - 2749
49	Shale, dark-gray, slightly calcareous, with considerable interbedded very fine, dense, somewhat argillaceous dark-gray limestone containing abundant fragments of shells	2749 - 2798
17	Limestone, very fine, dense to crystalline, dark-gray, containing abundant fragments of shells, with some interbedded dark-gray shale	2798 - 2815
20	Shale, gray, with some interbedded very fine, dense to crystalline, gray limestone containing fragments of shells	2815 - 2835
	Clinton group, 259 feet	
38	Shale, gray, with a little interbedded gray, slightly calcareous siltstone	2835 - 2873
95	Shale, greenish-gray, with a very little interbedded gray, slightly calcareous siltstone	2873 - 2968
64	Shale, greenish-gray, with a little interbedded very fine, crystalline, gray sandy limestone containing fragments of shells	2968 - 3032
30	Shale, greenish-gray	3032 - 3062
5	Shale, greenish-gray	3062 - 3067
2	Shale, dark-gray	3067 - 3069
1	Limestone, mottled, brick-red and gray, hematitic	3069 - 3070
13	Shale, dark-gray	3070 - 3083
1	Limestone, very fine, crystalline, mottled brick-red and gray, hematitic	3083 - 3084
2	Siltstone, light-greenish-gray	3084 - 3086
3	Shale, dark-gray	3086 - 3089

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine-grained, light-greenish-gray	3089 - 3094
	ORDOVICIAN SYSTEM, 3004 feet	
	Upper Ordovician or Cincinnatian Series, 1960 feet	
	Juniata formation, 956 feet	
17	Shale, brick-red, sandy	3094 - 3111
10	Sandstone, very fine-grained, brick-red, with a little interbedded greenish-gray shale	3111 - 3121
36	Shale, brick-red, in part sandy	3121 - 3157
5	Sandstone, very fine-grained, red, with some interbedded brick-red silty shale	3157 - 3162
16	Shale, brick-red, silty	3162 - 3178
19	Sandstone, very fine- to fine-grained, light-gray to light-brownish-red, with a great deal of interbedded brick-red silty shale	3178 - 3197
12	Sandstone, very fine-grained, red, ferruginous, with some interbedded brick-red shale	3197 - 3209
269	Sandstone, fine- to medium-grained, red, somewhat calcareous, with a little interbedded brick-red and greenish-gray shale	3209 - 3478
36	Sandstone, very fine-grained, pink, with a little interbedded dark-gray silty shale	3478 - 3514
36	Sandstone, fine- to medium-grained, brick-red, somewhat argillaceous, ferruginous and calcareous, with a little interbedded brick-red shale	3514 - 3550
37	Sandstone, very fine-grained, brick-red, somewhat argillaceous and ferruginous and slightly calcareous, with a little interbedded brick-red shale	3550 - 3587
20	Sandstone, very fine- to fine-grained, pink, with a little interbedded very fine-grained, light-greenish-gray sandstone in lower part	3587 - 3607
55	Sandstone, very fine-grained, pink	3607 - 3662
12	Shale, brick-red, sandy, with a little interbedded greenish-gray shale	3662 - 3674

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Thickness Feet	Description of Strata	Depth in feet
38	Sandstone, very fine-grained, brick-red, somewhat argillaceous and ferruginous, with a little interbedded brick-red and greenish-gray shale	3674 - 3712
82	Sandstone, fine-grained, pink, with a little interbedded brick-red shale	3712 - 3794
10	Sandstone, very fine-grained, brick-red, somewhat argillaceous and ferruginous, with a little interbedded brick-red shale and a little greenish-gray shale	3794 - 3804
8	Shale, brick-red, sandy	3804 - 3812
16	Sandstone, very fine-grained, brick-red, somewhat argillaceous and ferruginous, with a little interbedded brick-red shale	3812 - 3828
12	Sandstone, very fine-grained, light-greenish-gray to pink, with some interbedded greenish-gray shale and a little dark-gray shale	3828 - 3840
34	Sandstone, very fine-grained, pink	3840 - 3874
14	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, with some interbedded brick-red shale	3874 - 3888
9	Shale, greenish- and reddish-gray, sandy, with some interbedded brick-red shale	3888 - 3897
10	Sandstone, very fine-grained, pink, with a little interbedded brick-red shale	3897 - 3907
7	Sandstone, very fine- to fine-grained, pink	3907 - 3914
9	Sandstone, fine-grained, greenish-gray to reddish-brown	3914 - 3923
8	Sandstone, very fine- to fine-grained, brick-red, somewhat argillaceous and ferruginous, with a little interbedded brick-red shale	3923 - 3931
20	Sandstone, very fine-grained, greenish-gray to brick-red, somewhat argillaceous	3931 - 3951
8	Shale, brick-red, sandy	3951 - 3959
15	Sandstone, very fine-grained, greenish-gray to brick-red with a little interbedded brick-red and greenish-gray shale	3959 - 3974
12	Sandstone, very fine-grained, pink	3974 - 3986
19	Sandstone, very fine- to fine-grained, greenish-gray to brick-red, somewhat argillaceous	3986 - 4005

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Thickness Feet	Description of Strata	Depth in fee
12	Sandstone, very fine- to fine-grained, pink, with a little interbedded brick-red shale	4005 - 4017
19	Sandstone, very fine- to fine-grained, greenish-gray to brick-red, somewhat argillaceous, with a little interbedded brick-red shale	4017 - 4036
14	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous, with some interbedded very fine- to fine-grained, mottled greenish-gray and reddish-brown sandstone	4036 - 4050
	Oswego sandstone, 288 feet	
34	Sandstone, very fine-grained, light-greenish-gray to light-pink, somewhat argillaceous	4050 - 4084
13	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous	4084 - 4097
8	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded dark-gray shale	4097 - 4105
41	Sandstone, very fine-grained, mottled light-brownish- and greenish-gray, somewhat argillaceous and slightly calcareous, friable	4105 - 4146
20	Sandstone, very fine-grained, greenish-gray, somewhat argillaceous and slightly calcareous, with a little interbedded gray shale in upper part	4146 - 4166
54	Sandstone, fine-grained, greenish-gray, somewhat argillaceous and slightly calcareous	4166 - 4220
87	Sandstone, very fine-grained, greenish-gray, somewhat argillaceous and slightly calcareous	4220 - 4307
31	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous	4307 - 4338
	Lorraine shale, 559 feet	
158	Shale, dark-gray, with a little interbedded very fine-grained, light-greenish-gray somewhat argillaceous and slightly calcareous sandstone	4338 - 4496
18	Shale, dark-gray, with some interbedded greenish-gray siltstone	4496 - 4514
6	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous and slightly calcareous, with considerable interbedded dark-gray shale	4514 - 4520

Mahaney No. 1

Thickness Feet	Description of Strata	Depth in feet
248	Shale, dark-gray, with some interbedded gray siltstone containing fragments of shells	4520 - 4768
129	Shale, dark-gray, with some interbedded gray, slightly calcareous silty shale	4768 - 4897
	Utica shale, 157 feet	
157	Shale, very dark-gray, with some interbedded dark-gray, slightly calcareous silty shale	4897 - 5054
	Middle Ordovician or Champlainian Series, 833 feet	
	Top of Trenton limestone	5054
13	Limestone, very fine, crystalline, mottled light- and dark-brownish-gray, somewhat argillaceous, containing fragments of shells	5054 - 5067
49	Limestone, very fine, very dark-gray, argillaceous, containing fragments of shells	5067 - 5116
38	Limestone, very fine, very dark-gray, shaly, containing fragments of shells, with some interbedded light-gray bentonite	5116 - 5154
16	Limestone, very fine, very dark-gray, argillaceous, containing fragments of shells	5154 - 5170
15	Limestone, very fine, very dark-gray, shaly, containing fragments of shells including crinoid stems, with considerable interbedded light-gray bentonite	5170 - 5185
10	Limestone, very fine, very dark-gray, shaly, with a little interbedded light-gray bentonite	5185 - 5195
10	Limestone, very fine, very dark-gray, shaly, containing fragments of shells	5195 - 5205
29	Limestone, very fine, very dark-gray, shaly, with some interbedded light-gray bentonite	5205 - 5234
31	Limestone, very fine, very dark-gray, shaly, with a little interbedded light-gray bentonite	5234 - 5265
8	Shale, very dark-gray, very calcareous	5265 - 5273
15	Limestone, very fine, very dark-gray, shaly	5273 - 5288
41	Shale, very dark-gray, very calcareous	5288 - 5329
78	Limestone, very fine, very dark-gray, argillaceous, containing fragments of shells	5329 - 5407
26	No samples	5407 - 5433

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Thickness Feet	Description of Strata	Depth in feet
12	Limestone, very fine, very dark-gray, shaly	5433 - 5445
81	Limestone, very fine, very dark-gray, shaly, with some interbedded very fine-crystalline, brownish-gray, limestone containing fragments of shells	5445 - 5526
38	Limestone, very fine, crystalline, brownish-gray, containing fragments of shells, with a great deal of interbedded very dark-gray, shaly limestone	5526 - 5564
32	Limestone, very fine, very dark-gray, shaly, with some interbedded very fine, crystalline, dark-brownish-gray limestone containing fragments of shells	5564 - 5596
63	Limestone, very fine, very dark-gray, shaly	5596 - 5659
14	No samples	5659 - 5673
15	Shale, very dark-gray, calcareous, with some interbedded very fine, dark-gray, argillaceous limestone, and a little light-gray bentonite	5673 - 5688
82	Limestone, lithographic, dark-brownish-gray, slightly argillaceous	5688 - 5770
12	Limestone, lithographic, light- to dark-brownish-gray	5770 - 5782
71	Limestone, very fine, dark-brownish-gray, somewhat argillaceous and magnesian	5782 - 5853
34	Limestone, very fine, very dark-brownish-gray, somewhat argillaceous and magnesian	5853 - 5887
	Lower Ordovician or Canadian Series, 211 feet	
	Tribes Hill limestone, 211 feet	
35	Limestone, very fine, light- to dark-brownish-gray, argillaceous and somewhat magnesian	5887 - 5922
84	Limestone, very fine, light-gray, argillaceous, containing a few fine- to medium-sized subrounded and frosted quartz grains	5922 - 6006
6	Limestone, very fine, light-gray, argillaceous and somewhat magnesian	6006 - 6012
6	Limestone, very fine, light-gray, sandy and somewhat magnesian quartz grains, very fine to fine, with some of larger ones subrounded and frosted	6012 - 6018

Description of Strata	Depth in feet
Limestone, very fine, light-gray, silty, argillaceous and somewhat magnesian, containing a few rounded and frosted quartz grains	6018 - 6024
Limestone, very fine, light-gray to gray, argillaceous and somewhat magnesian	6024 - 6061
Limestone, very fine, crystalline, light-gray, dolomitic	6061 - 6077
Limestone, very fine, crystalline, light-gray, dolomitic and argillaceous	6077 - 6098
CAMBRIAN SYSTEM, 68+ feet	
Upper Cambrian Series, 68+ feet	
Little Falls dolomite, 68+ feet	
Dolomite, very fine to fine, crystalline, light-gray	6098 - 6108
Dolomite, very fine, crystalline, light-gray, somewhat silty, containing an occasional fine- to medium-sized subrounded and frosted quartz grain	6108 - 6139
Dolomite, fine, crystalline, light-gray, somewhat silty	6139 - 6151
Dolomite, very fine, crystalline, light-gray, silty and sandy, containing some fine- to medium-sized subrounded and frosted quartz grains	6151 - 6156
No samples	6156 - 6166
TOTAL DEPTH	6166

WELL-SAMPLE RECORD
NO.
47

WELL-SAMPLE RECORD

Joe. Farkas No. 1 Well

Reserve Oil Company

Tompkins County, New York, Town of Lansing
Genoa Quadrangle, 2.04 miles north of 42° 30' N. Lat. and .29 mile west of 76° 30' W. Long.

Completed: May 1932
Elevation: 850 feet above sea-level
Total Depth: 6210 feet
Deepest formation: Trenton limestone
Result: No show of oil or gas and no water encountered in this well.
Samples: 1367 to 6210 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 1603+ feet	
	Upper Devonian Series, 195+ feet	
195	No samples	0 - 195
	Middle Devonian Series, 1343 feet	
	Tully limestone, 20 feet	
20	Limestone from drillers' log	195 - 215
	Hamilton group, 1206 feet	
1152	No samples	215 - 1367
3	Shale, very dark-gray, slightly calcareous	1367 - 1370

Joe Farkas. No. 1

Thickness Feet	Description of Strata	Depth in fee
11	Limestone, very fine, dense, dark- to very dark-gray, argillaceous, containing fragments of shells	1370 - 1381
3	Limestone, very fine, dense, brownish-gray	1381 - 1384
37	Shale, grayish-black, somewhat calcareous, containing some pyrite	1384 - 1421
	Onondaga limestone, 117 feet	
13	Limestone, very fine, dense, dark- to very dark-gray, argillaceous	1421 - 1434
2	Bentonite, light-gray to grayish-brown, containing some pyrite, Tioga	1434 - 1436
13	Limestone, very fine, dense, very dark-gray, shaly	1436 - 1449
21	Limestone, very fine, dense, gray to dark-gray	1449 - 1470
19	Limestone, very fine, dense, dark-gray	1470 - 1489
7	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing fragments of shells	1489 - 1496
29	Limestone, very fine, dense, gray to dark-gray, argillaceous, with a little interbedded very dark-gray slightly calcareous shale	1496 - 1525
3	Limestone, dark-gray, shaly, containing a little glauconite	1525 - 1528
10	Shale, dark-gray, somewhat calcareous containing some glauconite and a considerable quantity of fine- to medium-rounded and frosted quartz grains	1528 - 1538
	Lower Devonian series, 65 feet	
	Helderberg group, 65 feet	
40	Limestone, very fine, crystalline, dark-gray, argillaceous, containing some brownish-gray chert in upper part and fragments of shells in lower part	1538 - 1578
10	Limestone, very fine, crystalline, brownish- to dark-brownish-gray, argillaceous and silty	1578 - 1588

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Limestone, very fine, crystalline, mottled light- and dark-gray, somewhat argillaceous and silty, containing fragments of shells	1588 - 1603
	SILURIAN SYSTEM, 2369 feet	
	Upper Silurian or Cayugan Series, 1807 feet	
	Manlius limestone, 482 feet	
22	Limestone, very fine, dense to crystalline, mottled light- to dark-gray, argillaceous and magnesian, containing abundant fragments of shells	1603 - 1625
18	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous and magnesian	1625 - 1643
32	Limestone, very fine, dense to crystalline, dark-brownish-gray, somewhat argillaceous and magnesian	1643 - 1675
10	Limestone, very fine, dense to crystalline, mottled light- to dark-brownish-gray, somewhat argillaceous and magnesian, containing fragments of shells	1625 - 1685
23	Limestone, very fine, dense to crystalline, dark-brownish-gray, somewhat argillaceous and magnesian, containing fragments of shells in lower part	1685 - 1708
27	Limestone, very fine, dense to crystalline, light- to dark-brownish-gray, argillaceous and somewhat magnesian with an occasional shell fragment in lower part	1708 - 1735
70	Limestone, very fine, dense to crystalline, dark-gray, containing occasional fragments of shells	1735 - 1805
8	Dolomite, very dense to crystalline, dark-gray, somewhat argillaceous	1805 - 1813
17	Limestone, very fine, dense, gray to dark-gray, dolomitic	1813 - 1830
10	Limestone, very fine, crystalline, gray, dolomitic	1830 - 1840
18	Limestone, very fine, dense, gray, dolomitic	1840 - 1858
14	Limestone, very fine, crystalline, dark-gray, dolomitic and somewhat argillaceous, containing fragments of shells	1858 - 1872
56	Limestone, very fine, dense, dark- to very dark-gray, somewhat argillaceous, containing occasional fragments of shells	1872 - 1928

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in fee
30	Limestone, very fine, dense to crystalline, dark-gray, somewhat argillaceous, containing occasional fragments of shells	1928 - 1958
57	Limestone, very fine, dense to crystalline, mottled light and dark-gray, argillaceous and somewhat silty	1958 - 2015
9	Limestone, very fine, dense, dark-gray, somewhat argillaceous	2015 - 2024
4	Limestone, very fine, dense to crystalline, gray, somewhat argillaceous and magnesian	2024 - 2028
11	Limestone, very fine, dense, somewhat argillaceous and magnesian	2028 - 2039
6	Limestone, very fine, dense to crystalline, light-gray to gray, dolomitic	2039 - 2045
13	Limestone, very fine, dense, brownish-gray, argillaceous, containing a very little dense brownish-gray chert	2045 - 2058
27	Limestone, very fine, dense to crystalline, containing occasional shell fragments	2058 - 2085
	Cobleskill limestone, 126 feet	
13	Limestone, very fine, dense to crystalline, gray, argillaceous and somewhat magnesian, containing some fine to medium, subangular to subrounded, frosted quartz grains	2085 - 2098
25	Limestone, very fine, dense to crystalline, gray, argillaceous and dolomitic, with some interbedded very fine, dense, dark-gray argillaceous and somewhat magnesian limestone	2098 - 2123
19	Limestone, very fine, dense to crystalline, light-gray to gray, dolomitic and somewhat argillaceous	2123 - 2142
22	Limestone, very fine, dense to crystalline, dark- to very dark-gray, somewhat argillaceous	2142 - 2164
47	Limestone, very fine, dense, dark-gray, somewhat magnesian and somewhat argillaceous, containing fragments of shells	2164 - 2211

Thickness Feet	Description of Strata	Depth in feet
	Salina group, 1199 feet	
	Camillus formation, 887 feet	
7	Limestone, very fine, dense, brownish-gray, argillaceous and somewhat magnesian, containing some anhydrite	2211 - 2218
65	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing a great deal of very fine-crystalline anhydrite	2218 - 2283
52	Dolomite, very fine, dense, dark-brownish-gray, somewhat argillaceous	2283 - 2335
20	Claystone, dark-gray, somewhat dolomitic, containing a little anhydrite	2335 - 2355
10	Claystone, gray, somewhat dolomitic, containing some anhydrite, with considerable interbedded dark-gray slightly dolomitic shale	2355 - 2365
16	Shale, very dark-gray, dolomitic	2365 - 2381
26	Shale, light-greenish-gray, somewhat dolomitic, containing an occasional fine-rounded quartz grain	2381 - 2407
14	Limestone, very fine, dense, gray to dark-gray, argillaceous and dolomitic	2407 - 2421
86	Shale, gray to dark-gray, somewhat calcareous, containing a little anhydrite and an occasional fine, rounded and frosted quartz grain	2421 - 2507
16	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous, with a little interbedded coarse-crystalline, light-gray salt	2507 - 2523
22	Shale, dark- to very dark-gray, calcareous, with a little interbedded salt	2523 - 2545
6	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous	2545 - 2551
6	Shale, dark-gray, with some interbedded salt	2551 - 2557
13	Limestone, dark- to very dark-gray, shaly and slightly magnesian, with a little interbedded salt	2557 - 2570
22	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous, with some interbedded salt	2570 - 2592
38	Shale, light-gray, dolomitic, with some interbedded salt	2592 - 2630

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in fee
6	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, with some interbedded anhydrite and salt	2630 - 2636
22	Shale, gray, with some interbedded salt	2636 - 2658
41	Dolomite, very fine, dense, dark-brownish-gray, argillaceous, with some interbedded salt	2658 - 2699
6	Shale, gray, somewhat dolomitic, with some interbedded dark-gray, somewhat dolomitic shale, with some interbedded salt	2699 - 2705
4	Limestone, very fine, dense, dark-gray, argillaceous and dolomitic	2705 - 2709
28	Salt, coarse-crystalline, light-gray to light-pink, with some interbedded light-greenish-gray somewhat dolomitic clay	2709 - 2737
12	Shale, brownish- to dark-brownish-gray, somewhat dolomitic, with some interbedded coarse-crystalline salt	2737 - 2749
10	Clay, brownish-gray, somewhat dolomitic, with some interbedded dark-gray shale	2749 - 2759
41	Shale, light-greenish-gray, very slightly calcareous	2759 - 2800
9	Shale, light-greenish-gray, very slightly calcareous, containing an occasional fine well rounded and frosted quartz grain with some interbedded mottled brick-red and greenish-gray shale, and some salt	2800 - 2809
8	Shale, light-greenish-gray, very slightly calcareous, with some interbedded salt	2809 - 2817
22	Shale, light-greenish-gray, very slightly calcareous, containing occasional fine, subangular quartz grains, with some interbedded mottled brick-red and greenish-gray shale	2817 - 2839
16	Shale, light-greenish-gray, slightly dolomitic	2839 - 2855
7	Shale, grayish-red	2855 - 2862
86	Shale, light-greenish-gray, dolomitic, with some interbedded dark-gray dolomitic shale	2862 - 2948
15	Shale, light-greenish-gray, slightly dolomitic with some interbedded dark-gray, slightly dolomitic shale and some salt	2948 - 2963

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
25	Shale, dark-gray, slightly dolomitic, with some interbedded light-greenish-gray, slightly dolomitic shale, a little anhydrite and some salt	2963 - 2988
14	Shale, dark-gray, dolomitic, with some interbedded salt	2988 - 3002
37	Shale, light-greenish-gray, slightly dolomitic, with considerable interbedded dark-gray slightly dolomitic shale and a little anhydrite	3002 - 3039
23	Shale, dark-gray, slightly dolomitic, with considerable interbedded light-greenish-gray dolomitic shale, a little anhydrite and some salt	3039 - 3062
19	Shale, dark-gray, slightly calcareous, with some interbedded greenish-gray slightly calcareous shale	3062 - 3081
17	Shale, light-greenish-gray, slightly dolomitic, with a little interbedded anhydrite and some salt	3081 - 3098
	Vernon shale, 287 feet	
4	Shale, brick-red, slightly dolomitic	3098 - 3102
39	Shale, variegated, brick-red and greenish-gray, containing a very little anhydrite	3102 - 3141
19	Shale, brick-red, very slightly dolomitic	3141 - 3160
17	Shale, brick-red, slightly dolomitic, containing a very little anhydrite with a little interbedded light-greenish-gray slightly dolomitic shale	3160 - 3177
88	Shale, brick-red	3177 - 3265
29	Shale, brick-red, with some interbedded light-greenish-gray shale	3265 - 3294
79	Shale, brick-red, with a little interbedded light-greenish-gray shale	3294 - 3373
12	Shale, light-greenish-gray, slightly dolomitic	3373 - 3385
	Pittsford shale, 25 feet	
5	Shale, gray, slightly dolomitic	3385 - 3390
20	Shale, dark-gray	3390 - 3410

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
	Middle Silurian or Niagaran Series, 562 feet	
	McKenzie formation, 257 feet	
21	Limestone, very fine, crystalline, very dark-gray, dolomitic and somewhat argillaceous	3410 - 3431
6	Shale, very dark-gray, calcareous, with considerable interbedded very fine-crystalline, dark-gray somewhat argillaceous and magnesian limestone containing fragments of shells	3431 - 3437
4	Shale, very dark-gray, calcareous, containing fragments of shells	3437 - 3441
51	Shale, very dark-gray, calcareous	3441 - 3492
15	Limestone, very fine, dense, very dark-gray, somewhat argillaceous and magnesian	3492 - 3507
16	Limestone, dark-gray, shaly, containing an occasional shell fragment	3507 - 3523
13	Shale, dark-gray, somewhat calcareous, with some interbedded very fine-crystalline gray limestone containing fragments of shells	3523 - 3536
68	Shale, dark-gray, slightly calcareous, with some interbedded dark-gray calcareous siltstone containing fragments of shells	3536 - 3604
14	Shale, dark-gray, somewhat calcareous and in part silty, containing fragments of shells	3604 - 3618
49	Shale, dark-gray, containing fragments of shells in upper part, intersected for a vertical distance of 49 feet by a dike of mica peridotite	3618 - 3667
	Clinton group, 305 feet	
10	Shale, greenish-gray	3667 - 3677
53	Shale, greenish-gray, with a little interbedded very fine grained, light greenish-gray slightly calcareous siltstone	3677 - 3730
50	Shale, greenish-gray	3730 - 3780
13	Shale, greenish-gray, with a very little interbedded reddish-brown ferriginous limestone	3780 - 3793

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, greenish-gray	3793 - 3799
54	Shale, greenish-gray, with a little interbedded greenish-gray very slightly calcareous siltstone	3799 - 3853
22	Shale, greenish-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	3853 - 3875
5	Shale, gray, with a little interbedded very fine, crystalline, reddish-brown, ferriginous limestone containing fragments of shells	3875 - 3880
13	Shale, purplish-gray, with considerable interbedded greenish-gray shale and a little greenish-gray slightly calcareous shale	3880 - 3893
19	Shale, purplish-gray, with a little interbedded greenish-gray shale	3893 - 3912
13	Shale, purplish-gray, with some interbedded greenish-gray shale and some greenish-gray slightly calcareous siltstone	3912 - 3925
16	Shale, greenish-gray, with a little interbedded greenish-gray siltstone containing fragments of shells	3925 - 3941
22	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	3941 - 3963
9	Shale, gray, with a little interbedded greenish-gray, slightly calcareous siltstone and a little brick-red in part oölitic hematite	3963 - 3972
	ORDOVICIAN SYSTEM, 2238+ feet	
	Upper Ordovician or Cincinnatian Series, 2144 feet	
	Juniata formation, 798 feet	
3	Shale, brick-red, silty, with some interbedded greenish-gray shale	3972 - 3975
5	Shale, brick-red, silty, with considerable interbedded very fine-grained, light-greenish-gray to light-pink sandstone and some greenish-gray shale	3975 - 3980
26	Shale, dark-brick-red, silty, with a little interbedded greenish-gray shale	3980 - 4006

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in fee
51	Shale, brick-red, sandy, with a little interbedded very fine-grained, light-gray sandstone	4006 - 4057
10	Sandstone, very fine-grained, light-gray to pink, with a little interbedded brick-red shale	4057 - 4067
7	Shale, brick-red	4067 - 4074
4	Sandstone, fine- to medium-grained, pink	4074 - 4078
9	Sandstone, fine- to medium-grained, light-gray to pink, with a little interbedded brick-red shale	4078 - 4087
5	Sandstone, fine- to medium-grained, brick-red	4087 - 4092
3	Sandstone, medium-grained, light-gray to pink	4092 - 4095
11	Sandstone, fine- to medium-grained, brick-red, argillaceous	4095 - 4106
11	Sandstone, fine-grained, pink	4106 - 4117
27	Sandstone, fine-grained, brick-red, argillaceous, with a little interbedded brick-red shale	4117 - 4144
58	Sandstone, fine- to medium-grained, pink	4144 - 4202
7	Sandstone, fine-grained, brick-red, argillaceous	4202 - 4209
30	Sandstone, medium-grained, pink	4209 - 4239
21	Sandstone, fine-grained, brick-red, argillaceous	4239 - 4260
6	Sandstone, fine- to medium-grained, pink	4260 - 4266
4	Sandstone, fine-grained, brick-red, argillaceous	4266 - 4270
24	Sandstone, fine- to medium-grained, pink, in part argillaceous	4270 - 4294
29	Sandstone, fine- to medium-grained, brick-red, argillaceous	4294 - 4323
5	Shale, sandy, brick-red	4323 - 4328
55	Sandstone, fine-grained, brick-red, argillaceous	4328 - 4383
12	Sandstone, fine-grained, pink	4383 - 4395
14	Sandstone, medium-grained, pink	4395 - 4409
8	Sandstone, fine-grained, brick-red, argillaceous	4409 - 4417

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Sandstone, fine- to medium-grained, pink	4417 - 4431
27	Sandstone, medium-grained, pink, argillaceous	4431 - 4458
37	Sandstone, fine- to medium-grained, pink, argillaceous	4458 - 4495
31	Sandstone, fine-grained, brick-red, argillaceous	4495 - 4526
6	Sandstone, medium-grained, pink	4526 - 4532
13	Shale, brick-red, sandy, with some interbedded, brick-red argillaceous sandstone	4532 - 4545
15	Sandstone, fine- to medium-grained, brick-red, argillaceous, with a little interbedded brick-red shale	4545 - 4560
23	Sandstone, medium-grained, pink	4560 - 4583
20	Sandstone, fine- to medium-grained, pink, argillaceous	4583 - 4603
9	Shale, brick-red, sandy, with some interbedded brick-red shale	4603 - 4612
16	Sandstone, fine-grained, brick-red, argillaceous	4612 - 4628
22	Sandstone, fine-grained, pink, argillaceous and slightly calcareous, with a little interbedded brick-red shale in lower part	4628 - 4650
19	Sandstone, fine- to medium-grained, brick-red, with a little interbedded brick-red, silty shale in lower part	4650 - 4669
6	Sandstone, fine-grained, reddish- and greenish-gray, argillaceous, with considerable interbedded brick-red shale	4669 - 4675
7	Shale, brick-red, sandy and somewhat calcareous	4675 - 4682
17	Sandstone, fine-grained, greenish- and reddish-gray, argillaceous and slightly calcareous	4682 - 4699
6	Sandstone, fine-grained, brick-red, argillaceous	4699 - 4705
19	Sandstone, fine-grained, grayish-green, argillaceous, with some interbedded fine-grained, brick-red, argillaceous sandstone	4705 - 4724
13	Sandstone, fine-grained, brick-red to grayish-green, argillaceous and somewhat calcareous in upper part	4724 - 4737

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, medium-grained, grayish-green, argillaceous	4737 - 4743
7	Sandstone, fine-grained, reddish- to greenish-gray, argillaceous	4743 - 4750
11	Sandstone, fine-grained, light-greenish-gray, argillaceous	4750 - 4761
9	Sandstone, fine-grained, light-greenish- and reddish-gray, argillaceous	4761 - 4770
	Oswego sandstone, 598 feet	
10	Sandstone, very fine-grained, dark-grayish-green, somewhat argillaceous, with some intrusive mica peridotite	4770 - 4780
20	Sandstone, fine-grained, grayish- to dark-grayish-green, somewhat argillaceous	4780 - 4800
38	Peridotite, mica - igneous intrustive	4800 - 4838
18	Sandstone, fine-grained, grayish-green, somewhat argillaceous and slightly calcareous, with some interbedded gray shale in middle part	4838 - 4856
44	Sandstone, fine-grained, light-greenish-gray, slightly calcareous	4856 - 4900
35	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	4900 - 4935
28	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded gray shale	4935 - 4963
31	Sandstone, very fine-grained, light-greenish-gray, with a little interbedded gray shale	4963 - 4994
30	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded gray shale	4994 - 5024
25	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded gray to dark-gray shale	5024 - 5049
11	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous	5049 - 5060
10	Sandstone, fine-grained, gray, somewhat argillaceous, with a little interbedded gray shale	5060 - 5070
36	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	5070 - 5106

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous, with considerable interbedded gray shale	5106 - 5112
31	Sandstone, very fine- to fine-grained, light-greenish-gray	5112 - 5143
41	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous	5143 - 5184
62	Sandstone, very fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded gray shale	5184 - 5246
52	Sandstone, very fine-grained, light-greenish-gray	5246 - 5298
19	Sandstone, very fine-grained, light-gray	5298 - 5317
6	Shale, dark-gray, with considerable interbedded, very fine-grained, light-greenish-gray, somewhat argillaceous sandstone	5317 - 5323
25	Sandstone, very fine-grained, light-gray to light-greenish-gray, containing a little biotite and muscovite, with some interbedded gray shale	5323 - 5348
20	Sandstone, very fine grained, light-gray, containing a little biotite and muscovite	5348 - 5368
	Lorraine shale, 600 feet	
17	Shale, dark-gray, in part silty, with some interbedded, very fine-grained, light-gray sandstone, containing a little biotite and muscovite	5368 - 5385
9	Shale, dark-gray, with considerable interbedded, gray- to dark-gray siltstone, containing a little biotite and muscovite	5385 - 5394
12	Shale, dark-gray, with some interbedded gray siltstone, containing fragments of shells	5394 - 5406
5	Shale, dark-gray	5406 - 5411
19	Shale, dark-gray, with a little interbedded greenish-gray siltstone, containing a little biotite and muscovite	5411 - 5430
11	Shale, dark-gray, with some interbedded, very fine-grained, light-gray, somewhat calcareous sandstone, containing a little biotite and muscovite	5430 - 5441
30	Shale, dark-gray, in part silty	5441 - 5471

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
42	Shale, dark-gray, with some interbedded dark-greenish-gray siltstone, containing a little biotite and muscovite	5471 - 5513
38	Shale, dark-gray, with some interbedded dark-greenish-gray, somewhat calcareous, siltstone, containing a little biotite and muscovite and an occasional shell fragment	5513 - 5551
84	Shale, dark-gray, with some interbedded, dark-greenish-gray, slightly calcareous silty shale and siltstone, containing fragments of shells	5551 - 5635
97	Shale, dark-gray, with considerable interbedded, dark-greenish-gray, slightly calcareous, silty shale, containing fragments of shells	5635 - 5732
76	Shale, dark-gray, with some interbedded, dark-gray, slightly calcareous, silty shale	5732 - 5808
12	Shale, dark- to very dark-gray	5808 - 5820
148	Shale, dark- to very dark-gray, with a little interbedded dark-gray, slightly calcareous, siltstone	5820 - 5968
	Utica shale, 148 feet	
10	Shale, very dark-gray, slightly calcareous	5968 - 5978
9	Shale, dark- to very dark-gray, with a little interbedded, dark-gray, slightly calcareous siltstone	5978 - 5987
87	Shale, very dark-gray, slightly calcareous and in part silty	5987 - 6074
7	Shale, very dark-gray to grayish-black, slightly calcareous and in part silty	6074 - 6081
28	Shale, dark- to very dark-gray, slightly calcareous and in part silty	6081 - 6109
7	Shale, dark-gray, silty and slightly calcareous, with some interbedded, very dark-gray, slightly calcareous shale	6109 - 6116
	Middle Ordovician or Champlainian Series, 94 feet	
	Top of Trenton limestone	6116
29	Limestone, very fine, very dark-gray, argillaceous, containing fragments of shells	6116 - 6145

Joe Farkas No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Limestone, very fine, very dark-gray, shaly	6145 - 6151
9	Limestone, very fine, very dark-gray, shaly, with some interbedded, light-gray bentonite, containing minutely disseminated pyrite	6151 - 6160
13	Limestone, very fine, very dark-gray, shaly	6160 - 6173
22	Limestone, very fine, dark-gray, shaly, with a little interbedded, light-gray bentonite	6173 - 6195
15	Shale, very dark-gray, somewhat calcareous, with some interbedded, very fine, dark-gray, argillaceous limestone	6195 - 6210
	TOTAL DEPTH	6210

WELL-SAMPLE RECORD

NO.

48

Well-Sample Record

Edward C. Kesselring No. 1 Well

New York State Natural Gas Corporation

Chemung County, New York, Town of Van Etten
Waverly Quadrangle: 2.22 miles north of 42° 10' N. Lat. and
1.89 miles west of 76° 30' W. Long.
Completed: June 3, 1953
Elevation: 1077 feet above sea level
Total Depth: 11,145 feet. The entire depth was drilled with cable tools making it the deepest cable tool well ever drilled.
Deepest formation: Theresa
Result: 20,000 cubic feet of gas at 3036 in the Oriskany sandstone; salt water at 3090 feet in Oriskany sandstone; show of gas at 6592 in Whirlpool sandstone; show of salt water at 7180 feet in Oswego sandstone; gas pockets at 8800 and 8888 feet in Utica shale; gas pockets at 8972 and 9187 feet in Middle Ordovician limestone; small volume of salt water at 11,118 feet in Theresa formation and large volume at 11,145 feet.
Samples: 0-11,145 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 3321 feet	
	Upper Devonian Series, 1651+ feet	
87	Shale, greenish-gray, silty	0 - 87
38	Shale, dark-greenish-gray, silty, with some interbedded dark-gray shale	87 - 125
16	Shale, dark-gray, with some interbedded dark-greenish-gray, silty shale	125 - 141
92	Shale, dark-greenish-gray, silty, with a little interbedded dark-gray shale	141 - 233
6	Siltstone, greenish-gray, with some interbedded dark-gray shale	233 - 239
11	Shale, greenish-gray, silty, with some interbedded dark-gray shale	239 - 250

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in fee
31	Siltstone, greenish-gray, with some interbedded dark-gray shale	250 - 281
24	Shale, greenish-gray, silty, with considerable interbedded dark-gray shale	281 - 305
37	Siltstone, dark-greenish-gray, with considerable interbedded dark-gray shale	305 - 342
8	Shale, dark-gray, silty, with some interbedded dark-gray shale	342 - 350
31	Siltstone, greenish-gray, with some interbedded dark-gray shale	350 - 381
12	Sandstone, very fine-grained, greenish-gray, argillaceous and slightly calcareous, with some interbedded dark-gray shale	381 - 393
32	Shale, dark-gray, silty, with some interbedded dark- to very dark-gray shale, and some gray, somewhat calcareous siltstone	393 - 425
10	Shale, dark- to very dark-gray, with some interbedded greenish-gray siltstone	425 - 435
52	Shale, dark-gray, silty, with some interbedded very dark-gray shale	435 - 487
34	Siltstone, gray, with some interbedded dark-gray silty shale	487 - 521
49	Shale, gray to dark-gray, silty	521 - 570
50	Shale, gray to dark-gray, in part silty	570 - 620
31	Shale, gray, silty	620 - 651
6	Siltstone, gray, containing occasional subrounded to rounded quartz grains up to 2 millimeters in diameter	651 - 657
22	Shale, gray to dark-gray, silty, containing occasional fragments of shells	657 - 679
27	Siltstone, gray- to greenish-gray, containing occasional fragments of shells, with considerable interbedded gray- to dark-gray shale	679 - 706
21	Shale, dark-brownish-gray, micaceous and silty, containing an occasional shell fragment	706 - 727

esselring No. 1

hickness Feet	Description of Strata	Depth in feet
15	Shale, dark-brownish-gray, micaceous and silty	727 - 742
48	Shale, gray, silty, with some interbedded gray- to greenish-gray siltstone	742 - 790
41	Siltstone, gray, somewhat calcareous, containing an occasional shell fragment in upper part, with some interbedded gray shale	790 - 831
5	Shale, dark-brownish-gray, silty	831 - 836
30	Shale, gray, silty, containing occasional fragments of shells	836 - 866
8	Siltstone, dark-brownish-gray, somewhat calcareous, containing an occasional shell fragment	866 - 874
3	Shale, gray, silty	874 - 877
21	Shale, dark-brownish-gray, silty	877 - 898
6	Siltstone and sandstone, very fine- to fine, dark-brownish- and greenish-gray, argillaceous and very slightly calcareous	898 - 904
9	Shale, dark-gray, sandy, containing some minute muscovite flakes	904 - 913
14	Shale, dark-brownish-gray, silty, containing an occasional quartz grain up to .35 millimeter in diameter	913 - 927
118	Shale, dark-gray, silty, containing occasional shell fragments	927 - 1045
37	Shale, dark-brownish-gray, silty	1045 - 1082
72	Shale, gray to dark-gray	1082 - 1154
126	Shale, dark-gray, with considerable interbedded gray, silty shale	1154 - 1280
98	Shale, gray in part silty	1280 - 1378
85	Shale, gray to dark-gray, in part silty	1378 - 1463
54	Shale, very dark-gray, in part silty	1463 - 1517
83	Shale, dark-gray, in part silty	1517 - 1600
10	Shale, dark-gray, silty	1600 - 1610

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in fee
18	Shale, dark- to very dark-gray, in part silty	1610 - 1628
23	Shale, dark-gray, somewhat calcareous	1628 - 1651
	Middle Devonian Series, 1382 feet	
	Tully limestone, 82 feet	
32	Limestone, very fine, clastic, light-gray to gray, argillaceous	1651 - 1683
32	Limestone, very fine, clastic, dark-gray, somewhat argillaceous	1683 - 1715
18	Shale, gray to dark-gray, somewhat calcareous, with some interbedded very fine, clastic, gray, somewhat argillaceous limestone	1715 - 1733
	Hamilton group, 1251 feet	
78	Shale, gray to dark-gray, slightly calcareous	1733 - 1811
24	Shale, gray, slightly calcareous	1811 - 1835
138	Shale, dark-gray, somewhat calcareous, containing fragments of shells	1835 - 1973
160	Shale, dark-gray, in part silty and very slightly calcareous, containing an occasional shell fragment	1973 - 2133
212	Shale, dark-gray, silty, containing an occasional shell fragment	2133 - 2345
21	Shale, very dark-gray, silty	2345 - 2366
96	Shale, dark-gray, silty and very slightly calcareous	2366 - 2462
63	Shale, dark-gray, in part silty and very slightly calcareous, containing an occasional brachiopod shell fragment in upper part	2462 - 2525
158	No samples	2525 - 2683
45	Shale, dark-gray, somewhat calcareous	2683 - 2728
101	Shale, very dark-gray, somewhat calcareous	2728 - 2829
49	Shale, very dark-gray, calcareous	2829 - 2878
42	Shale, grayish-black	2878 - 2920

esselring No. 1

hickness Feet	Description of Strata	Depth in feet
6	Shale, grayish-black, in part calcareous	2920 - 2926
2	Limestone, very fine- to fine-clastic, gray to very dark-gray, argillaceous, containing abundant fragments of minute shells	2926 - 2928
56	Shale, grayish-black, in part calcareous	2928 - 2984
	Onondaga formation, 50 feet	
1	Bentonite, grayish-brown, micaceous, containing minutely disseminated pyrite, Tioga	2984 - 2985
6	Shale, grayish-black, calcareous	2985 - 2991
14	Limestone, very fine- to fine-clastic, dark- to very dark-gray, containing minute fragments of shells	2991 - 3005
11	Shale, grayish-black, calcareous, containing some small fragments of shells, with some interbedded very fine to fine, clastic, limestone, containing abundant fragments of shells	3005 - 3016
8	Limestone, very fine to fine, clastic, gray to very dark-gray, shaly, containing numerous small fragments of shells with some interbedded very dark-gray, calcareous shale layers	3016 - 3024
5	Limestone, very fine, clastic, brownish-gray to dark-gray, containing an occasional shell fragment and considerably interbedded very dark-gray to grayish-black calcareous shale	3024 - 3029
5	Limestone, very fine, clastic, light-gray to gray, argillaceous, with considerable interbedded grayish-black, calcareous shale	3029 - 3034
	Lower Devonian Series, 287 feet	
	Oriskany sandstone, 67 feet	
7	Sandstone, fine- to medium-grained, light-gray, quartzose and somewhat calcareous	3034 - 3041
14	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose and somewhat calcareous	3041 - 3055
6	Sandstone, fine- to medium-grained, light-brownish-gray, quartzose and somewhat calcareous, containing fragments of a shell	3055 - 3061

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, fine-grained, light-brownish-gray, quartzose and somewhat calcareous	3061 - 3067
9	Sandstone, very fine to fine, dark-brownish-gray, quartzose and calcareous, containing a few medium to coarse, rounded and frosted quartz grains	3067 - 3076
6	Limestone, very fine, clastic, dark-brownish-gray, silty and sandy	3076 - 3082
19	Sandstone, fine- to medium-grained, light-gray, quartzose and calcareous in lower part	3082 - 3101
	Helderberg group, 220 feet	
19	Limestone, very fine, clastic, dark-gray, shaly, containing occasional fragments of shells including brachiopods and some light-gray, nearly white, tripolitic chert	3101 - 3120
12	Limestone, very fine, clastic, very dark-gray, shaly, containing an occasional shell fragment with some interbedded very fine, clastic, brownish-gray limestone containing abundant fragments of shells	3120 - 3132
27	Limestone, very fine to coarse, clastic, mottled light- to dark-brownish-gray, argillaceous, containing fragments of shells and a very little light-brownish-gray subchalcedonic chert	3132 - 3159
13	Limestone, very fine, clastic, dark-gray, argillaceous, containing light-gray to white tripolitic chert and some light-brownish- to brownish-gray chert and an occasional shell fragment	3159 - 3172
19	Limestone, very fine, clastic, very fine to coarse, clastic dark-gray, containing light-gray to white tripolitic chert and some brownish-gray subchalcedonic chert and an occasional shell fragment	3172 - 3191
27	Limestone, very fine, clastic, dark-gray, shaly, containing some light-gray tripolitic chert and a little light-brownish- to brownish-gray subchalcedonic chert	3191 - 3218
48	Limestone, very fine, clastic, mottled light - to dark-brownish-gray	3218 - 3266
55	Limestone, very fine, clastic, mottled light- to dark-grayish-brown, containing abundant fragments of shells	3266 - 3321

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM, 3331 feet	
	Upper Silurian or Cuyugan Series, 2352 feet	
	Rondout limestone, 46 feet	
46	Limestone, very fine, clastic, light-gray, argillaceous and silty, containing a little anhydrite	3321 - 3367
	Cobleskill limestone, 57 feet	
57	Limestone, very fine, clastic, dark-gray, arcillaceous, containing occasional microfossil shells and some brownish-gray subchalcedonic chert	3367 - 3424
	Salina group, 2249 feet	
	Camillus formation, 1861 feet	
42	Limestone, very fine, clastic, gray to dark-gray, containing some anhydrite	3424 - 3466
10	Limestone, very fine, clastic, light-brownish- to brownish-gray, argillaceous and magnesian, with considerable interbedded very fine-crystalline, light-brownish- to brownish-gray anhydrite	3466 - 3476
23	Anhydrite, very fine, crystalline, light-brownish- to brownish-gray, with a great deal of interbedded very fine, clastic, dark-gray limestone	3476 - 3499
26	Limestone, very fine, clastic, dark-gray, argillaceous and magnesian, containing some interbedded very fine, crystalline anhydrite	3499 - 3525
21	Limestone, very fine, clastic, brownish- to dark-brownish-gray, dolomitic, containing some anhydrite	3525 - 3546
61	Limestone, very fine, clastic, gray to dark-gray, argillaceous and magnesian, containing some anhydrite	3546 - 3607
21	Shale, light- to very dark-gray, somewhat dolomitic, with some interbedded very fine, clastic, brownish-gray, argillaceous and magnesian limestone, containing a little anhydrite	3607 - 3628
38	Shale, light- to dark-gray, somewhat dolomitic, containing considerable anhydrite and an occasional medium to coarse, rounded and frosted quartz grain	3628 - 3666
17	Anhydrite, very fine, crystalline, light-gray, somewhat dolomitic	3666 - 3683
63	Salt, very coarse, crystalline, light-gray to colorless	3683 - 3746

Kesslering No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Shale, gray, somewhat dolomitic, containing considerable anhydrite, a few medium to coarse, rounded and frosted quartz grains and a little drusy quartz	3746 - 3766
22	Anhydrite, very fine, crystalline, light-gray, argillaceous, containing a few medium to coarse, rounded and frosted quartz grains and a few minute euhedral quartz crystals	3766 - 3788
3	Shale, very dark-gray, slightly dolomitic	3788 - 3791
13	Salt, very coarse, crystalline, colorless to light-gray, with considerable interbedded very fine, crystalline, light-gray argillaceous anhydrite	3791 - 3804
13	Anhydrite, very fine, crystalline, light-gray, argillaceous and dolomitic	3804 - 3817
13	Salt, coarse, crystalline, colorless to white, with a great deal of interbedded very fine-crystalline, argillaceous anhydrite	3817 - 3830
16	Salt, very coarse, crystalline, light-gray	3830 - 3846
45	Salt, very coarse, crystalline, light-gray, nearly colorless, with a great deal of interbedded very fine-crystalline argillaceous anhydrite	3846 - 3891
88	Salt, coarse, crystalline, light-gray, nearly white	3891 - 3979
21	Salt, coarse, crystalline, light-gray, nearly white, with considerable interbedded very fine-crystalline, light-gray, argillaceous and somewhat dolomitic anhydrite	3979 - 4000
15	Salt, coarse, crystalline, light-gray, nearly white	4000 - 4015
29	Salt, coarse to very coarse, crystalline, light-gray, nearly white, with some interbedded light- to dark-brownish-gray, argillaceous and somewhat dolomitic anhydrite	4015 - 4044
17	Salt, coarse- to very coarse-crystalline, light-gray, nearly white	4044 - 4061
15	Salt, coarse- to very coarse-crystalline, light-gray- to nearly white, with considerable interbedded very fine-crystalline, light-gray, argillaceous and somewhat dolomitic anhydrite	4061 - 4076
13	Anhydrite, very fine, crystalline, light-gray, argillaceous and somewhat dolomitic, containing a few medium to coarse rounded and frosted quartz grains	4076 - 4089

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
15	Salt, coarse to very coarse, crystalline, light-gray, nearly white	4089 - 4104
8	Anhydrite, very fine, crystalline, light-gray, argillaceous and somewhat dolomitic, containing considerable medium to coarse, rounded and frosted quartz grains and some minute euhedral quartz crystals	4104 - 4112
15	Salt, coarse- to very coarse-crystalline, light-gray, nearly white, with a great deal of interbedded, very fine-crystalline, light-brownish-gray, argillaceous and somewhat dolomitic anhydrite	4112 - 4127
56	Salt, coarse- to very coarse-crystalline, light-gray, nearly white	4127 - 4183
29	Limestone, fine- to medium-crystalline, light-brownish-gray, containing some medium to coarse, subrounded and frosted quartz grains and a few euhedral quartz crystals	4183 - 4212
14	No samples	4212 - 4226
56	Salt, coarse to very coarse, crystalline, light-gray to nearly white	4226 - 4282
2	Salt, coarse- to very coarse-crystalline, light-gray, almost white, with a great deal of interbedded light-grayish-brown, somewhat dolomitic claystone	4282 - 4284
16	Salt, coarse- to very coarse-crystalline, light-gray, nearly white	4284 - 4300
10	Salt, coarse- to very coarse-crystalline, light-gray, nearly white, with a great deal of interbedded gray, somewhat dolomitic claystone	4300 - 4310
89	Salt, coarse- to very coarse-crystalline, light-gray, nearly white	4310 - 4399
11	Claystone, light-brownish-gray, dolomitic, containing a little very fine, crystalline anhydrite with some interbedded dark-gray calcareous shale	4399 - 4410
28	Limestone, very fine, clastic, dark-gray, with considerable interbedded light-brownish-gray claystone containing a little anhydrite	4410 - 4438
27	Shale, dark-gray, somewhat dolomitic, with considerable interbedded coarse- to very coarse-crystalline light-gray, almost white salt, and some light-brownish-gray, somewhat dolomitic claystone	4438 - 4465

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
11	Salt, coarse- to very coarse-crystalline, light-gray, almost white, with considerable interbedded dark-gray, somewhat dolomitic shale and light-brownish-gray claystone	4465 - 4476
13	Salt, coarse- to very coarse-crystalline, light-gray, almost white, with some interbedded dark-gray, somewhat dolomitic shale	4476 - 4489
23	Limestone, very fine, clastic, dark-gray, shaly and somewhat magnesian, with some interbedded coarse- to very coarse-crystalline, light-gray salt	4489 - 4512
17	Salt, coarse- to very coarse-crystalline, light-gray, with a great deal of interbedded very fine, clastic, dark-gray, argillaceous and somewhat magnesian limestone	4512 - 4529
13	Salt, coarse- to very coarse-crystalline, light-gray, with some interbedded very fine, clastic, argillaceous and somewhat magnesian limestone	4529 - 4542
27	Salt, coarse- to very coarse-crystalline, light-gray, with a little interbedded very fine, clastic, dark-gray, argillaceous and somewhat magnesian limestone	4542 - 4569
75	Anhydrite, very fine, crystalline, light-buff-gray, argillaceous and somewhat dolomitic, containing a few medium to coarse, subrounded and frosted quartz grains and a few minute euhedral quartz crystals	4569 - 4644
23	Limestone, very fine, clastic, light-buff-gray, argillaceous, with some interbedded grayish-brown, dolomitic and silty claystone containing considerable anhydrite and an occasional subrounded to rounded, medium to coarse, frosted quartz grain	4644 - 4667
7	Shale, buff-gray, dolomitic, containing considerable anhydrite and an occasional subrounded to rounded, medium to coarse, frosted quartz grain	4667 - 4674
45	Limestone, very fine, clastic, buff-gray, dolomitic and shaly, containing considerable anhydrite and an occasional subrounded to rounded, medium to coarse, frosted quartz grain	4674 - 4719
15	Claystone, light-gray to gray, dolomitic, containing a great deal of anhydrite and a few small euhedral quartz crystals	4719 - 4734
41	Claystone, light-gray to gray, dolomitic, with considerable interbedded coarse-crystalline, light-gray salt	4734 - 4775

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Salt, coarse to very coarse, crystalline, light-gray, with a great deal of interbedded light-gray, dolomitic claystone containing a little anhydrite	4775 - 4782
15	Claystone, light-gray, dolomitic, containing a little anhydrite	4782 - 4797
11	Salt, coarse- to very coarse-crystalline, with a great deal of interbedded light-gray, dolomitic claystone	4797 - 4808
8	Salt, coarse- to very coarse-crystalline, with a little interbedded light-gray, dolomitic claystone	4808 - 4816
59	Claystone, light-brownish-gray, dolomitic, containing a great deal of anhydrite and a few small euhedral quartz crystals, with some interbedded light-greenish-gray claystone	4816 - 4875
30	Claystone, light-greenish-gray, somewhat dolomitic, with a little interbedded light-brownish-gray, somewhat dolomitic claystone	4875 - 4905
55	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite, a few medium to coarse, subrounded to rounded, frosted quartz grains, and a few small euhedral quartz crystals	4905 - 4960
13	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite, with a little interbedded very fine, dense, gray, argillaceous and dolomitic limestone	4960 - 4973
14	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite	4973 - 4987
13	Claystone, light-greenish-gray, somewhat dolomitic, with a little interbedded gray, argillaceous and dolomitic limestone	4987 - 5000
12	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite	5000 - 5012
11	Claystone, light-greenish-gray, somewhat dolomitic, with a little interbedded gray dolomitic shale	5012 - 5023
12	Claystone, light-greenish-gray	5023 - 5035
7	Claystone, light-greenish-gray, somewhat dolomitic, with some interbedded dark-gray, somewhat dolomitic shale	5035 - 5042

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in fee
36	Claystone, light-greenish-gray, somewhat dolomitic, containing a little anhydrite	5042 - 5078
14	Shale, dark-gray, dolomitic, with a little interbedded light-greenish-gray, somewhat dolomitic claystone containing a few medium to coarse, subrounded to rounded quartz grains and a few small enhedral quartz crystals	5078 - 5092
8	Claystone, light-greenish-gray, somewhat dolomitic, with some interbedded dark- to very dark-gray argillaceous and somewhat dolomitic limestone	5092 - 5100
62	Claystone, light- to light-greenish-gray, somewhat dolomitic, containing a little anhydrite and an occasional medium to coarse, rounded and frosted quartz grain	5100 - 5162
16	Claystone, light-greenish-gray, somewhat dolomitic, containing an occasional small enhedral quartz crystal, with some interbedded very fine, clastic, gray, argillaceous and dolomitic limestone	5162 - 5178
45	Claystone, light-gray to light-greenish-gray, somewnat calcareous, containing some anhydrite and an occasional coarse, rounded and frosted quartz grain	5178 - 5223
40	Limestone, very fine, clastic, gray to dark-gray, argillaceous and somewhat magnesian, containing some anhydrite and a few small enhedral quartz crystals with some interbedded light-greenish-gray, somewhat dolomitic claystone	5223 - 5263
22	Claystone, light-greenish-gray, somewhat dolomitic	5263 - 5285
	Vernon shale, 388 feet	
26	Claystone, light-greenish-gray, somewhat dolomitic, with some interbedded, somewhat dolomitic, brick-red claystone	5285 - 5311
6	Claystone, variegated brick-red and light-greenish-gray, somewhat dolomitic with some interbedded light-greenish-gray, somewhat dolomitic claystone	5311 - 5317
6	Claystone, brick-red, slightly dolomitic, with some interbedded light-greenish-gray, slightly dolomitic claystone	5317 - 5323
25	Claystone, brick-red, slightly dolomitic, containing an occasional small enhedral quartz crystal and a little anhydrite	5323 - 5348
18	Claystone, variegated brick-red and light-greenish-gray, slightly dolomitic	5348 - 5366

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Claystone, brick-red, slightly dolomitic	5366 - 5378
42	Claystone, variegated brick-red and light-greenish-gray, slightly dolomitic	5378 - 5420
153	Claystone, brick-red, very slightly dolomitic	5420 - 5573
17	Claystone, variegated light-greenish- and purplish-gray, somewhat dolomitic	5573 - 5590
29	Claystone, brick-red, somewhat dolomitic, with considerable interbedded light-greenish-gray, somewhat dolomitic claystone	5590 - 5619
33	Claystone, brick-red, somewhat calcareous	5619 - 5652
21	Claystone, light-greenish-gray, somewhat calcareous, with considerable interbedded dark-gray calcareous shale	5652 - 5673
	Middle Silurian or Niagaran Series, 707 feet	
	McKenzie formation, 244 feet	
6	Limestone, very fine-clastic, very dark-gray, argillaceous	5673 - 5679
15	Limestone, very fine, clastic, very dark-gray, argillaceous with some interbedded dark-gray shale	5679 - 5694
7	Limestone, very fine, clastic, very dark-gray, argillaceous and somewhat magnesian, with some interbedded dark-gray, slightly calcareous shale	5694 - 5701
13	Limestone, very fine, clastic, very dark-gray, argillaceous, with considerable interbedded dark-gray, somewhat calcareous shale	5701 - 5714
21	Shale, dark-gray, somewhat calcareous, with some interbedded very fine, clastic, very dark-gray argillaceous limestone containing microfossils	5714 - 5735
8	Shale, dark-gray	5735 - 5743
29	Shale, very dark-gray to grayish-black, calcareous	5743 - 5772
19	Shale, very dark-gray to grayish-black, calcareous, with considerable interbedded very fine, clastic, very dark-gray argillaceous and somewhat magnesian limestone	5772 - 5791
9	Shale, dark- to very dark-gray, calcareous	5791 - 5800

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
19	Shale, dark-gray, somewhat calcareous, with some interbedded fine to medium, clastic, gray to dark-gray argillaceous limestone, containing fragments of shells including brachiopods and microfossils	5800 - 5819
82	Shale, dark-gray, somewhat calcareous, with a little interbedded dark-gray, fine to medium, clastic, dark-gray argillaceous limestone containing fragments of shells including brachiopods and microfossils	5819 - 5901
16	Shale, dark-gray, somewhat calcareous, with some interbedded very fine to medium, clastic, gray, argillaceous limestone, containing abundant fragments of shells	5901 - 5917
	Clinton group, 463 feet	
5	Shale, dark-gray, somewhat calcareous, with some interbedded coarse, clastic, light-gray, argillaceous limestone containing interstitial red hematite	5917 - 5922
21	Shale, light-greenish-gray, slightly calcareous, with some interbedded coarse, clastic, light-gray limestone containing abundant fragments of shells	5922 - 5943
64	Shale, light-greenish-gray, containing an occasional fragment of a shell	5943 - 6007
26	Shale, light-greenish-gray, with a little interbedded greenish-gray siltstone and very fine-grained sandstone	6007 - 6033
120	Shale, light-grayish-green, containing occasional fragments of shells	6033 - 6153
131	Shale, light-grayish-green, with a little interbedded grayish-green, very slightly calcareous siltstone, containing occasional shell fragments	6153 - 6284
11	Shale, light-greenish-gray	6284 - 6295
11	Shale, light-greenish and pinkish-gray, containing fragments of shells	6295 - 6306
12	Shale, light-pinkish-gray	6306 - 6318
23	Shale, light-purplish-gray, with some interbedded gfayish-green shale	6318 - 6341
28	Shale, purplish-gray, with a little interbedded greenish-gray shale and a very little greenish-gray slightly calcareous siltstone containing some fragments of shells	6341 - 6369

Thickness Feet	Description of Strata	Depth in feet
11	Shale, light-greenish- to greenish-gray, with some interbedded purplish-gray shale and a little slightly calcareous oölitic red hematite	6369 - 6380
	Lower Silurian or Albion Series, 272 feet	
	Grimsby sandstone, 159 feet	
11	Shale, brick-red, silty with some interbedded light-greenish-gray shale	6380 - 6391
3	Sandstone, very fine-grained, red, quartzitic, with some interbedded greenish-gray shale and some very fine-grained, light-greenish-gray sandstone	6391 - 6394
11	Shale, brick-red, silty, with a little interbedded light-greenish-gray silty shale and siltstone	6394 - 6405
3	Sandstone, very fine, red, in part argillaceous, with a little interbedded very fine-grained, light-gray sandstone	6405 - 6408
7	Sandstone, very fine-grained, light-gray, quartzitic	6408 - 6415
7	Shale, brick-red, silty, with a little interbedded very fine-grained, light-greenish-gray sandstone	6415 - 6422
12	Sandstone, very fine-grained, light-greenish-gray, with some interbedded light-pink siltstone	6422 - 6434
10	Shale, brick-red, silty	6434 - 6444
5	Sandstone, very fine-grained, brick-red, argillaceous, with a little interbedded very fine-grained, light-gray quartzitic sandstone	6444 - 6449
6	Sandstone, very fine- to fine-grained, pink, somewhat argillaceous	6449 - 6455
8	Shale, light-greenish-gray, in part silty	6455 - 6463
8	Shale, brick-red, silty, with some interbedded light-greenish-gray shale and a little very fine-grained, light-gray quartzitic sandstone	6463 - 6471
14	Shale, brick-red, silty	6471 - 6485
10	Sandstone, very fine-grained, pink, somewhat argillaceous with a little interbedded grayish-red and a little light-greenish-gray sandstone	6485 - 6495

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Sandstone, very fine-grained, light-pink, quartzitic, with some interbedded very fine-grained light-gray sandstone	6495 - 6511
8	Shale, grayish-green, silty, with some interbedded grayish-red silty shale	6511 - 6519
2	Sandstone, very fine-grained, light-pinkish-gray, quartzitic	6519 - 6521
18	Shale, grayish-red, silty, with some interbedded greenish-gray silty shale	6521 - 6539
	Whirlpool sandstone, 113 feet	
3	Sandstone, medium-grained, light-gray, quartzitic	6539 - 6542
4	Sandstone, medium- to coarse-grained, light-gray, almost white, quartzitic	6542 - 6546
11	Sandstone, fine- to medium-grained, light-gray, quartzitic, with some larger quartz grains rounded	6546 - 6557
18	Sandstone, fine- to medium-grained, light-gray, nearly white, quartzose	6557 - 6575
6	Sandstone, medium- to coarse-grained, light-gray, nearly white, quartzose	6575 - 6581
13	Sandstone, fine- to medium-grained, light-buff-gray, quartzose	6581 - 6594
10	Sandstone, medium- to coarse-grained, light-gray, almost white, quartzose, larger quartz grains rounded and frosted	6594 - 6604
17	Sandstone, medium-grained, light-gray, almost white, quartzose, some of quartz grains rounded and frosted	6604 - 6621
14	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	6621 - 6635
12	Sandstone, medium- to coarse-grained, light-gray, almost white, quartzose	6635 - 6647
5	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	6647 - 6652

Thickness Feet	Description of Strata	Depth in feet
	ORDOVICIAN SYSTEM, 3384 feet	
	Upper Ordovician or Cincinnatian Series, 2258 feet	
	Juniata sandstone, 498 feet	
5	Sandstone, fine- to medium-grained, very light-pinkish-gray, quartzose	6652 - 6657
5	Sandstone, fine- to medium-grained, very light-pinkish-gray, quartzose, with a very little interbedded light-greenish-gray siltstone	6657 - 6662
10	Sandstone, fine-grained, very light-pinkish-gray, quartzose	6662 - 6672
7	Sandstone, fine-grained, very light-pinkish-gray, quartzose, with some interbedded very fine-grained, light-greenish-gray, somewhat argillaceous shale and a little light-greenish-gray shale	6672 - 6679
10	Sandstone, fine-grained, very light-pinkish-gray quartzose	6679 - 6689
22	Sandstone, fine-grained, light-pinkish-gray, with some interbedded very fine-grained, light-greenish-gray, somewhat argillaceous sandstone and a little light-greenish-gray shale	6689 - 6711
16	Sandstone, very fine- to fine-grained, very light-pinkish-gray, quartzose	6711 - 6727
14	Sandstone, very fine- to fine-grained, quartzose, with a great deal of interbedded mottled, very fine-grained, greenish- and reddish-gray, somewhat argillaceous sandstone	6727 - 6741
8	Sandstone, very fine- to fine-grained, reddish-gray, somewhat argillaceous with a little interbedded reddish-gray shale	6741 - 6749
8	Sandstone, very fine- to fine-grained, light-pink, slightly argillaceous, with some interbedded, very fine-grained, light-greenish-gray, argillaceous sandstone	6749 - 6757
19	Sandstone, fine-grained, light-pink, slightly argillaceous, with a little interbedded light-grayish-green shale	6757 - 6776
32	Sandstone, fine-grained, light-pink, slightly argillaceous, with a little interbedded greenish-gray argillaceous sandstone and a little light-greenish-gray shale	6776 - 6808

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
12	Sandstone, fine-grained, light-pink, slightly argillaceous	6808 - 6820
39	Sandstone, very fine- to fine-grained, mottled, light-greenish-gray and pink, somewhat argillaceous	6820 - 6859
12	Sandstone, very fine- to fine-grained, reddish-gray, argillaceous	6859 - 6871
12	Sandstone, very fine- to fine-grained, mottled reddish- and greenish-gray, argillaceous, with a little interbedded light-greenish-gray shale	6871 - 6883
17	Sandstone, very fine- to fine-grained, pink, somewhat argillaceous, with some interbedded light-grayish-green shale	6883 - 6900
14	Sandstone, very fine- to fine-grained, light-pink, somewhat argillaceous, with some interbedded light-grayish-green shale	6900 - 6914
32	Sandstone, very fine-grained, light-greenish- and pinkish-gray, somewhat argillaceous, with some interbedded light-grayish-green shale	6914 - 6946
27	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded light-grayish-green shale	6946 - 6973
2	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with many quartz grains rounded and frosted	6973 - 6975
62	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	6975 - 7037
13	Sandstone, fine- to medium-grained, light-greenish- and pinkish-gray, somewhat argillaceous	7037 - 7050
18	Sandstone, very fine- to fine-grained, light-greenish- and pinkish-gray, argillaceous, with some interbedded light-grayish-green shale	7050 - 7068
29	Sandstone, fine- to medium-grained, light-greenish-gray, somewhat argillaceous, containing many subrounded to rounded and frosted quartz grains	7068 - 7097
12	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	7097 - 7109
41	Sandstone, very fine- to fine-grained, light-greenish- and pinkish-gray, somewhat argillaceous, with some of larger quartz grains rounded	7109 - 7150

Kegselring No. 1

Thickness Feet	Description of Strata	Depth in feet
	Oswego sandstone, 909 feet	
26	Sandstone, fine- to medium-grained, light-greenish-gray, slightly argillaceous	7150 - 7176
12	Sandstone, fine-grained, light-gray, quartzose	7176 - 7188
17	Sandstone, fine-grained, light-gray, slightly argillaceous	7188 - 7205
4	Sandstone, fine-grained, light-greenish-gray, argillaceous with some interbedded light-grayish-green shale	7205 - 7209
10	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous	7209 - 7219
11	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded light-grayish-green shale	7219 - 7230
39	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous	7230 - 7269
36	Sandstone, fine-grained, greenish-gray, somewhat argillaceous	7269 - 7305
18	Sandstone, fine-grained, greenish-gray, somewhat argillaceous, with some interbedded light-grayish-green shale	7305 - 7323
14	Sandstone, fine-grained, greenish-gray, somewhat argillaceous	7323 - 7337
7	Sandstone, fine-grained, greenish-gray, somewhat argillaceous, with a little interbedded light-grayish-green shale	7337 - 7344
21	Sandstone, very fine-grained, greenish-gray, somewhat argillaceous	7344 - 7365
12	Sandstone, very fine-grained, greenish-gray, somewhat argillaceous, with a little interbedded light-grayish-green shale	7365 - 7377
15	Sandstone, fine-grained, greenish-gray, somewhat argillaceous	7377 - 7392
11	Sandstone, very fine- to fine-grained, light-gray, quartzose	7392 - 7403
5	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7403 - 7408

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Sandstone, very fine- to fine-grained, light-greenish-gray, quartzose	7408 - 7424
18	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7424 - 7442
31	Sandstone, fine- to medium-grained, light-gray, almost white, quartzitic	7442 - 7473
31	Sandstone, fine-grained, light-greenish-gray, slightly argillaceous	7473 - 7504
6	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with a little interbedded light-greenish-gray shale	7504 - 7510
14	Sandstone, fine to medium, light-greenish-gray, somewhat argillaceous, containing some rounded and frosted quartz grains	7510 - 7524
11	Sandstone, fine-grained, light-gray, slightly argillaceous, containing some rounded quartz grains with a little interbedded gray shale	7524 - 7535
8	Sandstone, fine- to medium-grained, light-gray, quartzose, containing some rounded quartz grains	7535 - 7543
13	Sandstone, fine-grained, light-gray, almost white, quartzitic	7543 - 7556
11	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	7556 - 7567
4	Sandstone, fine-grained, light-greenish-gray, slightly argillaceous	7567 - 7571
6	Sandstone, fine-grained, light-greenish-gray, quartzose, containing some rounded quartz grains	7571 - 7577
17	Sandstone, fine-grained, light-greenish-gray, slightly argillaceous	7577 - 7594
5	Sandstone, very fine- to fine-grained, light-gray, almost white, quartzose	7594 - 7599
38	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7599 - 7637
28	Sandstone, very fine- to fine-grained, greenish-gray, somewhat argillaceous	7637 - 7665
28	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7665 - 7693

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
3	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous, with a little interbedded light-greenish-gray shale	7693 - 7696
13	Sandstone, very fine- to fine-grained, greenish-gray, somewhat argillaceous	7696 - 7709
13	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7709 - 7722
18	Sandstone, very fine- to fine-grained, greenish-gray, argillaceous, with some interbedded gray shale	7722 - 7740
50	Sandstone, fine-grained, light-greenish-gray, slightly argillaceous	7740 - 7790
75	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous, containing some rounded and frosted quartz grains	7790 - 7865
48	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	7865 - 7913
14	Sandstone, very fine- to fine-grained, light-gray, slightly argillaceous	7913 - 7927
7	Sandstone, very fine- to fine-grained, light-gray, slightly argillaceous, with a little interbedded gray shale	7927 - 7934
14	Sandstone, very fine- to fine-grained, light-gray, almost white, slightly argillaceous	7934 - 7948
37	Sandstone, very fine- to fine-grained, light-gray, almost white, slightly argillaceous, with a little interbedded gray shale	7984 - 7985
15	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly argillaceous	7985 - 8000
1	Shale, gray, in part silty, with some interbedded very fine- to fine-grained, light-greenish-gray, slightly argillaceous sandstone	8000 - 8001
9	Sandstone, very fine- to fine-grained, light-greenish-gray, with a little interbedded gray shale	8001 - 8010
21	Sandstone, very fine- to fine-grained, light-gray, slightly argillaceous	8010 - 8031

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
4	Shale, gray to dark-gray, with some interbedded very fine- to fine-grained, light-gray, slightly argillaceous sandstone	8031 - 8035
5	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous	8035 - 8040
6	Sandstone, fine-grained, light-greenish-gray, somewhat argillaceous, with a very little interbedded gray, silty shale	8040 - 8046
4	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded gray shale, in part silty	8046 - 8050
3	Shale, greenish-gray, silty, with considerable interbedded greenish-gray argillaceous sandstone	8050 - 8053
2	Sandstone, very fine- to fine-grained, light-greenish-gray, somewhat argillaceous, with some interbedded gray shale, in part silty	8053 - 8055
4	Shale, gray, sandy, with some interbedded very fine- to fine-grained, light-greenish-gray sandstone	8055 - 8059
	Lorraine shale, 715 feet	
5	Shale, dark-greenish-gray, sandy	8059 - 8064
2	Sandstone, very fine- to fine-grained, argillaceous, with some interbedded dark-greenish-gray, sandy shale	8064 - 8066
12	Shale, greenish- to dark-greenish-gray, silty and sandy	8066 - 8078
7	Shale, very dark-gray, sandy and slightly calcareous, containing an occasional shell fragment	8078 - 8085
10	Shale, dark- to very dark-gray, silty and sandy	8085 - 8095
17	Shale, dark-gray, sandy	8095 - 8112
14	Shale, very dark-gray, sandy, with some interbedded, dark-gray shale	8112 - 8126
65	Shale, dark-gray, with a little interbedded greenish-gray silty shale	8126 - 8191
26	Shale, dark-gray, with a little interbedded gray, slightly calcareous siltstone containing occasional small fragments of shells	8191 - 8217

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
27	Shale, dark-gray, with some interbedded gray siltstone containing fragments of shells	8217 - 8244
10	Shale, very dark-gray, slightly calcareous, with considerable interbedded dark-gray shale	8244 - 8254
54	Shale, dark-gray, with some interbedded gray, somewhat calcareous siltstone containing fragments of shells	8254 - 8308
19	Shale, dark-gray, with considerable interbedded, dark-gray, calcareous siltstone containing fragments of shells	8308 - 8327
44	Shale, dark-gray, with some interbedded dark-gray, somewhat calcareous siltstone containing fragments of shells, including crinoid stems	8327 - 8371
20	Shale, very dark-gray, somewhat calcareous, with considerable interbedded, dark-gray, somewhat calcareous siltstone containing occasional fragments of shells	8371 - 8391
4	Siltstone, dark-gray, containing fragments of shells, with considerable interbedded very dark-gray shale	8391 - 8395
3	Sandstone, very fine-grained, dark-gray, somewhat calcareous, with considerable interbedded very dark-gray shale	8395 - 8398
17	Shale, very dark-gray, with considerable interbedded dark-gray, somewhat calcareous siltstone containing fragments of shells	8398 - 8415
4	Siltstone, dark-gray, somewhat calcareous, with some interbedded very dark-gray shale	8415 - 8419
18	Shale, very dark-gray, with considerable interbedded dark-gray, somewhat calcareous siltstone containing fragments of shells	8419 - 8437
8	Siltstone, dark-gray, somewhat calcareous, containing fragments of shells, with some interbedded very dark-gray shale	8437 - 8445
21	Shale, very dark-gray, with considerable interbedded dark-gray, slightly calcareous, silty shale containing fragments of shells	8445 - 8466
19	Shale, very dark-gray, with some interbedded dark-gray, slightly calcareous shale containing occasional fragments of shells	8466 - 8485
44	Shale, very dark-gray, with a little interbedded dark-gray, slightly calcareous siltstone	8485 - 8529

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
245	Shale, very dark-gray, with a very little interbedded dark-gray, slightly calcareous siltstone containing an occasional brachiopod shell in upper part	8529 - 8774
	Utica shale, 128 feet	
22	Shale, grayish-black, with a little interbedded very dark-gray, slightly calcareous shale	8774 - 8796
66	Shale, grayish-black, slightly calcareous. Gas pocket at 8800 feet	8796 - 8862
40	Shale, grayish-black, calcareous. Gas pocket at 8888 feet	8862 - 8902
	Middle Ordovician or Champlainian Series, 854 feet	
	Top of Trenton limestone	8902
13	Shale, grayish-black, calcareous, with some interbedded very fine, clastic, dark-gray, argillaceous limestone	8902 - 8915
12	Limestone, very fine, clastic, dark-gray, with considerable interbedded grayish-black, calcareous shale	8915 - 8927
21	Shale, grayish-black, calcareous, with some interbedded very fine, clastic, very dark-gray, argillaceous limestone	8927 - 8948
59	Shale, grayish-black, very calcareous	8948 - 9007
5	Limestone, very fine, clastic, very dark-gray, argillaceous, with some interbedded grayish-black, very calcareous shale	9007 - 9012
42	Shale, grayish-black, very calcareous, with considerable interbedded very fine to fine, clastic, dark-gray, argillaceous limestone containing abundant fragments of shells, including brachiopods	9012 - 9054
69	Limestone, very fine to fine, clastic, dark- to very dark-gray, argillaceous and silty, containing abundant fragments of shells, including brachiopods, with considerable interbedded grayish-black calcareous shale	9054 - 9123
7	Limestone, very fine to fine, clastic, dark- to very dark-gray, argillaceous and silty, containing fragments of shells and a very little light-gray, drusy chert	9123 - 9130
22	Shale, dark- to very dark-gray, calcareous, with considerable interbedded, very fine to fine, clastic, dark- to very dark-gray, argillaceous and silty limestone containing fragments of shells	9130 -9152

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Shale, grayish-black, calcareous, with some interbedded very fine to fine, clastic, dark- to very dark-gray argillaceous and silty limestone containing fragments of shells, including brachiopods	9152 - 9158
30	Limestone, very fine, clastic, dark-gray, argillaceous and silty, containing fragments of shells, including brachiopods, with considerable interbedded, grayish-black, somewhat calcareous shale	9158 - 9188
4	Shale, grayish-black, somewhat calcareous, with some interbedded very fine, clastic, dark-gray argillaceous and silty limestone, containing fragments of shells	9188 - 9192
13	Limestone, very fine, clastic, gray- to dark-gray, argillaceous and silty, containing abundant fragments of shells, including brachiopods, with considerable interbedded grayish-black, somewhat calcareous shale	9192 - 9205
71	Limestone, very fine, clastic, dark- to very dark-gray, argillaceous and silty, containing occasional fragments of shells, with some interbedded, very dark-gray to grayish-black, calcareous shale	9205 - 9276
24	Limestone, very fine, clastic, very dark-gray, argillaceous and silty, with considerable interbedded, very dark-gray to grayish-black calcareous shale	9276 - 9300
21	Shale, very dark-gray to grayish-black, calcareous, with considerable interbedded, very fine, clastic, dark-gray, argillaceous and silty limestone	9300 - 9321
11	Shale, very dark-gray to grayish-black, calcareous, with some interbedded, very fine, clastic, dark-gray, argillaceous and silty limestone containing occasional fragments of shells, including brachiopods, and a little interbedded light-gray bentonite	9321 - 9332
3	Limestone, very fine, clastic, dark- to very dark-gray, argillaceous and silty, containing abundant fragments of shells, including brachiopods, with some interbedded grayish-black, somewhat calcareous shale and a little interbedded light-gray bentonite	9332 - 9335
5	Limestone, very fine, clastic, very dark-gray, argillaceous and silty, containing abundant fragments of shells, including brachiopods, with a little interbedded grayish-black calcareous shale	9335 - 9340
3	Limestone, medium, clastic, dark-gray, argillaceous and silty, containing abundant fragments of shells, including brachiopods	9340 - 9343

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, clastic, dark- to very-dark-gray, argillaceous and silty, containing abundant fragments of shells	9343 - 9347
26	Limestone, very fine, clastic, gray to dark-gray, somewhat argillaceous, containing occasional fragments of shells	9347 - 9373
21	Limestone, very fine, lithographic, dark-gray, somewhat argillaceous	9373 - 9394
35	Limestone, very fine to fine, clastic, dark-brownish-gray, containing occasional fragments of shells in upper part	9394 - 9429
16	Limestone, very fine, lithographic, dark-brownish-gray, containing occasional fragments of shells	9429 - 9445
3	Limestone, very fine to fine, clastic, gray to dark-grayish-brown, containing fragments of shells	9445 - 9448
65	Limestone, very fine, lithographic, dark-brownish-gray, somewhat argillaceous, in part vaughnitic, containing occasional shell fragments	9448 - 9513
39	Limestone, very fine, lithographic, dark-brownish-gray, slightly argillaceous, containing an occasional shell fragment, with some interbedded, very fine, clastic, very dark-gray, somewhat argillaceous and silty limestone	9513 - 9552
14	Limestone, very fine, lithographic, very dark-brownish-gray, somewhat argillaceous, containing occasional fragments of brachiopod shells	9552 - 9566
12	Limestone, very fine, clastic, dark-gray to dark-brownish-gray, silty and somewhat argillaceous	9566 - 9578
6	Limestone, very fine, clastic, light-gray to gray, argillaceous and silty, with a little interbedded, very fine, lithographic, very dark-brownish-gray limestone	9578 - 9584
4	Limestone, very fine, clastic, light-gray to gray, argillaceous and silty, with a little interbedded grayish-ish-black, somewhat calcareous shale	9584 - 9588
3	Limestone, very fine, clastic, gray, argillaceous and silty, with a little interbedded very fine, clastic, very dark-gray argillaceous limestone	9588 - 9591
10	Limestone, very fine, clastic, very dark-gray to grayish-black, argillaceous	9591 - 9601

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine, lithographic, gray to very dark-gray, argillaceous and silty, with some interbedded, gray to dark-gray calcareous shale	9601 - 9609
18	Limestone, very fine, lithographic, dark-brownish-gray, somewhat magnesian	9609 - 9627
13	Limestone, very fine, lithographic, light-gray, with a little interbedded, very fine, clastic, gray limestone	9627 - 9640
8	Limestone, very fine, lithographic, light-gray, argillaceous and magnesian, with a very little interbedded, light-gray bentonite	9640 - 9648
12	Limestone, very fine, lithographic, light-gray, argillaceous, silty, and slightly magnesian, containing an occasional fine, subrounded and frosted quartz grain	9648 - 9660
9	Limestone, very fine, clastic, mottled light-gray and gray, very argillaceous and silty, slightly magnesian, containing a few fine to medium, subrounded and frosted quartz grains	9660 - 9669
15	Limestone, very fine, clastic, light-gray, very argillaceous and silty, somewhat magnesian, containing a few fine to medium, subrounded and frosted quartz grains	9669 - 9684
4	Limestone, very fine, lithographic, light-brownish-gray, argillaceous, slightly magnesian, containing an occasional fine to medium, rounded and frosted quartz grain	9684 - 9688
4	Limestone, very fine, clastic, very light-gray, argillaceous and silty, somewhat magnesian, containing a few fine to medium, subrounded and frosted quartz grains	9688 - 9692
15	Limestone, very fine, clastic, light-gray, very argillaceous and silty, somewhat magnesian	9692 - 9707
7	Limestone, very fine, lithographic, light-brownish-gray, somewhat argillaceous	9707 - 9714
9	Limestone, very fine, clastic, light-gray, almost white, somewhat argillaceous and silty, magnesian, with a little interbedded, very fine, lithographic, light-brownish-gray, somewhat argillaceous limestone	9714 - 9723
15	Limestone, very fine, clastic, light-gray, magnesian, and very argillaceous	9723 - 9738
18	Limestone, very fine, clastic, light-brownish- to dark-brownish-gray, magnesian and somewhat argillaceous, with some interbedded, very fine lithographic, brownish-gray limestone	9738 - 9756

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
	Lower Ordovician or Canadian Series, 280 feet	
	Tribes Hill limestone, 280 feet	
5	Limestone, very fine, clastic, dark-gray, shaly, slightly magnesian	9756 - 9761
16	Limestone, very fine, clastic, brownish-gray, argillaceous and silty, somewhat magnesian	9761 - 9777
3	Limestone, very fine, clastic, dark-gray, very argillaceous and silty, somewhat magnesian	9777 - 9780
4	Limestone, very fine, crystalline, dark-brownish-gray, somewhat argillaceous, silty, somewhat magnesian	9780 - 9784
13	Limestone, very fine, clastic, dark-brownish-gray, argillaceous and silty, somewhat magnesian	9784 - 9797
3	Limestone, very fine, clastic, brownish-gray, argillaceous and silty, somewhat magnesian, with considerable interbedded grayish-black, slightly calcareous shale	9797 - 9800
11	Limestone, very fine, clastic, light-gray to gray, argillaceous, somewhat magnesian, with considerable interbedded dark- to very dark-gray, somewhat calcareous shale	9800 - 9811
7	Limestone, very fine, clastic, very dark-gray, somewhat argillaceous, dolomitic	9811 - 9818
5	Limestone, very fine, clastic, light- to very dark-gray, somewhat argillaceous and silty, dolomitic	9818 - 9823
14	Limestone, very fine, crystalline, light-gray, somewhat argillaceous and silty, dolomitic	9823 - 9837
3	Dolomite, very fine, clastic, very dark-gray, somewhat argillaceous and silty, containing a few medium, subrounded and frosted quartz grains	9837 - 9840
6	Limestone, very fine, crystalline, light-brownish-gray, dolomitic and sandy, containing abundant very fine to fine, angular to subangular quartz grains and a few medium, rounded and frosted quartz grains	9840 - 9846
8	Sandstone, very fine-grained, light-brownish-gray, dolomitic, containing some rounded and frosted quartz grains up to 1.00 millimeter in diameter, with a little interbedded light-gray shale	9846 - 9854

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, medium- to coarse-grained, poorly sorted, light-gray, somewhat dolomitic, with many of larger quartz grains rounded and frosted and others showing secondary crystal faces	9854 - 9858
5	Sandstone, medium- to coarse-grained, poorly sorted, light-gray, dolomitic, larger quartz grains subrounded to rounded and frosted	9858 - 9863
5	Sandstone, fine- to medium-grained, poorly sorted, light-gray, dolomitic, larger quartz grains rounded and frosted	9863 - 9868
1	Shale, very dark-gray, dolomitic	9868 - 9869
9	Limestone, very fine, clastic, light-brownish-gray, argillaceous and silty, dolomitic, containing some rounded and frosted quartz grains to .5 millimeter in diameter	9869 - 9878
6	Limestone, very fine, clastic, light- to dark-brownish-gray, argillaceous and silty, dolomitic, containing a little brownish- to dark-brownish-gray, subchalcedonic chert, with considerable interbedded, very dark-gray, somewhat dolomitic shale	9878 - 9884
5	Limestone, very fine, shaly, gray, dolomitic	9884 - 9889
11	Dolomite, very fine, clastic, light- to dark-brownish-gray, somewhat argillaceous and silty, containing considerable light-brownish-gray and a little very dark-gray subchalcedonic chert	9889 - 9900
8	Limestone, fine, crystalline, light-gray, somewhat argillaceous and silty, dolomitic, containing a very little light-gray subchalcedonic chert	9900 - 9908
16	Dolomite, very fine, crystalline, light-brownish- to brownish-gray, silty	9908 - 9924
8	Dolomite, very fine, crystalline, light-gray, somewhat argillaceous and silty	9924 - 9932
5	Dolomite, very fine, crystalline, dark-gray, argillaceous and silty, containing a very little light-gray subchalcedonic chert	9932 - 9937
3	Shale, very dark-gray, calcareous	9937 - 9940
6	Dolomite, very fine, crystalline, light-gray to gray, somewhat silty and argillaceous	9940 - 9946

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Dolomite, very fine, crystalline, gray to very-dark-gray, argillaceous and silty, with some interbedded, gray to dark-gray, slightly calcareous shale	9946 - 9955
11	Dolomite, very fine, crystalline, light- to dark-gray, silty and argillaceous, containing a little light-brownish-gray subchalcedonic chert, with a little interbedded, gray to very dark-gray, slightly calcareous shale	9955 - 9966
9	Dolomite, very fine, crystalline, light-gray to light-brownish-gray, argillaceous and silty	9966 - 9975
8	Dolomite, very fine, crystalline, very dark-gray, somewhat argillaceous, containing a few angular quartz grains to .2 millimeter in diameter	9975 - 9983
21	Dolomite, very fine, crystalline, dark-gray, somewhat argillaceous and silty	9983 - 10,00
15	Dolomite, very fine, crystalline, light-gray, somewhat argillaceous and silty, containing a little light-brownish-gray subchalcedonic chert	10,004 - 10,01
17	Dolomite, very fine, crystalline, gray to dark-gray, somewhat argillaceous and silty	10,019 - 10,03
	CAMBRIAN SYSTEM, 989+ feet	
	Upper Cambrian Series, 989+ feet	
	Little Falls dolomite, 434 feet	
10	Dolomite, very fine to fine, crystalline, dark-brownish-gray, slightly argillaceous and silty	10,036 - 10,04
11	Dolomite, very fine, crystalline, dark-gray, somewhat argillaceous and silty	10,046 - 10,057
6	Dolomite, very fine to fine, crystalline, gray- to dark gray, somewhat argillaceous and silty, with a very little interbedded, very dark-gray to grayish-black shale	10,057 - 10,06
4	Dolomite, very fine, crystalline, light-gray, argillaceous and silty	10,063 - 10,067
8	Dolomite, very fine, crystalline, light- to dark-gray, very argillaceous and silty, with a little interbedded, dark-gray, slightly calcareous shale	10,067 - 10,075
5	Dolomite, very fine, crystalline, light-gray to gray, somewhat argillaceous and silty	10,075 - 10,080

Thickness in Feet	Description of Strata	Depth in feet
18	Dolomite, very fine to fine, crystalline, brownish- to dark-brownish-gray, argillaceous	10,080 - 10,098
7	Dolomite, very fine to fine, crystalline, brownish-gray, somewhat argillaceous and silty	10,098 - 10,105
11	Dolomite, very fine to fine, crystalline, dark-brownish-gray, somewhat argillaceous and silty	10,105 - 10,116
10	Dolomite, very fine to fine, crystalline, brownish-gray, somewhat argillaceous and silty, with some interbedded, very dark-gray to grayish-black, slightly calcareous shale	10,116 - 10,126
6	Dolomite, very fine to fine, crystalline, light-brownish-gray, somewhat argillaceous and silty	10,126 - 10,132
21	Dolomite, very fine to fine, crystalline, light- to dark-gray, somewhat silty, with a little interbedded dark-gray dolomitic shale	10,132 - 10,153
9	Limestone, very fine to fine, crystalline, light-gray, dolomitic, somewhat silty, with a little interbedded dark-gray, dolomitic shale	10,153 - 10,162
13	Limestone, very fine to fine, crystalline, light- to dark-gray, dolomitic, silty, containing occasional rounded and frosted quartz grains to .75 millimeter in diameter, with a little interbedded dark-gray dolomitic shale	10,162 - 10,175
5	Dolomite, very fine, crystalline, brownish- to dark-brownish-gray, somewhat argillaceous and silty	10,175 - 10,180
13	Dolomite, very fine to fine, crystalline, light-gray, somewhat argillaceous and silty, containing a few rounded and frosted quartz grains to .75 millimeter in diameter, with a little interbedded dark-gray dolomitic shale	10,180 - 10,193
8	Dolomite, very fine to fine, crystalline, brownish-gray, somewhat argillaceous and sandy, many of quartz grains subrounded to rounded and frosted, others possess secondary crystal faces, with a little interbedded dark-gray dolomitic shale	10,193 - 10,201
31	Dolomite, very fine to fine, crystalline, light- to dark-gray, argillaceous and silty, containing some rounded and frosted quartz grains to .5 millimeter in diameter	10,201 - 10,232

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Dolomite, medium to coarse, crystalline, light-gray, somewhat silty, containing a few rounded and frosted quartz grains to .5 millimeter in diameter	10,232 - 10,24
17	Dolomite, very fine to fine, crystalline, brownish- to dark-brownish-gray, argillaceous and silty, containing an occasional rounded quartz grain to .75 millimeter in diameter	10,242 - 10,25
10	Dolomite, fine, crystalline, light-brownish-gray, somewhat silty and argillaceous	10,259 - 10,26
4	Dolomite, fine to medium, crystalline, light- to dark-brownish-gray, somewhat silty and sandy, containing an occasional rounded and frosted quartz grain to .4 millimeter in diameter	10,269 - 10,27
19	Limestone, very fine to fine, crystalline, light-brownish- to brownish-gray, dolomitic, somewhat silty	10,273 - 10,29
6	Limestone, fine, crystalline, light-brownish-gray, dolomitic, slightly silty	10,292 - 10,29
6	Limestone, very fine to fine, crystalline, brownish-gray, dolomitic, somewhat silty	10,298 - 10,30
10	Limestone, very fine, crystalline, light-brownish- to brownish-gray, dolomitic, silty	10,304 - 10,31
4	Limestone, very fine- to fine, crystalline, light-gray, dolomitic, somewhat silty	10,314 - 10,31
14	Limestone, very fine, crystalline, light-gray, dolomitic, containing some light-gray tripolitic chert and a little light-gray to brownish-gray subchalcedonic chert	10,318 - 10,33
13	Limestone, very fine, crystalline, light-gray, dolomitic, containing some quartz silt and a little light-gray tripolitic chert	10,332 - 10,34
6	Limestone, very fine, crystalline, light-gray, dolomitic, containing some quartz silt and a little light-gray tripolitic chert, with a little interbedded dark-gray shale	10,345 - 10,35
8	Limestone, very fine, crystalline, light-brownish-gray, dolomitic, containing some quartz silt and a little light-gray tripolitic chert	10,351 - 10,35
5	Limestone, very fine, crystalline, gray, dolomitic, containing some quartz silt, with a little interbedded dark-gray shale	10,359 - 10,36

hickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, crystalline, light-gray to gray, dolomitic, containing some light-gray tripolitic chert, with a little interbedded very dark-gray to grayish-black shale	10,364 - 10,368
6	Dolomite, very fine to fine, crystalline, light-gray, containing some quartz silt	10.368 - 10,374
2	Dolomite, very fine, crystalline, light-gray to gray, containing some quartz silt, with a little interbedded gray to dark-gray shale	10,374 - 10,376
4	Dolomite, very fine, crystalline, brownish-gray, containing some quartz silt, with a little interbedded very dark-gray to grayish-black shale	10,376 - 10,380
1	Dolomite, very fine, crystalline, brownish-gray, containing some quartz silt	10,380 - 10,381
4	Dolomite, very fine, crystalline, dark-brownish-gray, containing some quartz silt, with a little interbedded very dark-gray shale	10,381 - 10,385
33	Dolomite, very fine to fine, crystalline, dark-brownish-gray, somewhat argillaceous and silty	10,385 - 10,418
4	Dolomite, very fine to fine, crystalline, light-brownish-gray, containing a little quartz silt	10,418 - 10,422
7	Dolomite, very fine to fine, crystalline, brownish-gray, containing some quartz silt	10,422 - 10,429
4	Dolomite, very fine to fine, crystalline, light-gray to gray, containing some quartz silt	10,429 - 10,433
9	Dolomite, fine to medium, crystalline, light-gray, containing a little light-gray tripolitic chert and a little brownish-gray subchalcedonic chert	10,433 - 10,442
12	Dolomite, very fine to fine, crystalline, gray to dark-gray, containing some quartz silt, with a little interbedded dark-gray to grayish-black shale	10,442 - 10,454
3	Dolomite, very fine, crystalline, brownish-gray, containing some quartz silt	10,454 - 10,457
2	Dolomite, very fine, crystalline, light-gray, containing some quartz silt, with a little interbedded dark-gray to grayish-black shale	10,457 - 10,459

Thickness Feet	Description of Strata	Depth in feet
7	Dolomite, very fine, crystalline, gray to dark-gray, somewhat argillaceous and silty	10,459 - 10,4
4	Dolomite, very fine, crystalline, dark-brownish-gray, somewhat argillaceous and silty	10,466 - 10,4
	Theresa formation, 675+ feet	
13	Limestone, very fine, crystalline, gray to dark-gray, dolomitic, containing considerable quartz silt	10,470 - 10,48
10	Limestone, very fine to fine, crystalline, light-gray- to gray, dolomitic, argillaceous and silty	10,483 - 10,49
11	Dolomite, very fine to fine, crystalline, light- to dark-gray, argillaceous and silty	10.493 - 10,50
11	Dolomite, very fine to fine, crystalline, gray to dark-gray, silty and somewhat argillaceous	10,504 - 10,51
9	Dolomite, very fine, crystalline, dark-gray, somewhat silty and argillaceous	10,515 - 10,52
10	Dolomite, very fine, crystalline, light-gray, somewhat argillaceous and silty	10,524 - 10,53
10	Dolomite, very fine, crystalline, light-gray to gray, silty, containing some light-gray tripolitic chert and occasional subrounded quartz grains to .5 millimeter in diameter	10,534 - 10,54
2	Dolomite, very fine, crystalline, gray to dark-gray, silty	10,544 - 10,54
7	Dolomite, very fine, crystalline, light-gray to gray, silty and sandy, containing some light-gray subchalcedonic chert with siliceous oölites to .3 millimeter in diameter	10,546 - 10,55
7	Dolomite, very fine, crystalline, gray, silty	10,553 - 10,56
2	Dolomite, very fine, crystalline, dark-gray, silty and argillaceous, containing an occasional rounded and frosted quartz grain to .5 millimeter in diameter	10,560 - 10,56
6	Dolomite, very fine, crystalline, dark-gray, somewhat argillaceous, containing considerable quartz silt and very fine sand, with some interbedded, very dark-gray shale	10,562 - 10,568

ickness Feet	Description of Strata	Depth in feet
3	Limestone, fine, crystalline, light-gray, dolomitic, containing considerable light-gray, tripolitic chert and a little very fine quartz sand and silt	10,568 - 10,571
7	Limestone, fine, crystalline, light-gray, dolomitic, containing a considerable quantity of rounded and frosted quartz grains to .75 millimeter in diameter and considerable light-gray tripolitic chert	10,571 - 10,578
6	Limestone, very fine, crystalline, light-brownish-gray, containing a considerable quantity of rounded and frosted quartz grains to .5 millimeter in diameter and some light-gray tripolitic chert	10,578 - 10,584
11	Dolomite, very fine, crystalline, light-gray, containing considerable light-gray semi-chalcedonic chert and some siliceous oölites to .5 millimeter in diameter and some light-gray tripolitic chert	10,584 - 10,595
9	Limestone, very fine, crystalline, light-gray, dolomitic, containing considerable light-gray semi-chalcedonic chert, in part dolomoldic, and some light-gray tripolitic chert	10,595 - 10,604
5	Limestone, very fine, crystalline, light-brownish-gray, dolomitic, containing some light-gray tripolitic chert and a little light-gray semi-chalcedonic chert	10,604 - 10,609
2	Limestone, very fine, crystalline, light-gray to dark-gray, dolomitic, silty, containing some light-gray tripolitic chert and a little light-gray semi-chalcedonic chert	10,609 - 10,611
9	Dolomite, very fine to fine, crystalline, light-gray-to gray, somewhat silty, containing a few rounded and frosted quartz grains to .25 millimeter in diameter	10,611 - 10,620
3	Dolomite, very fine, crystalline, light-gray to gray, somewhat silty, containing a few rounded and frosted quartz grains to .5 millimeter in diameter, with a little interbedded, very dark-gray to grayish-black shale	10,620 - 10,623
12	Dolomite, very fine, crystalline, light-gray to gray, containing a great deal of quartz silt and very fine angular sand and a few rounded and frosted quartz grains to .5 millimeter in diameter	10,623 - 10,635
10	Dolomite, very fine, crystalline, light-gray, somewhat silty, containing a few rounded and frosted quartz grains to .6 millimeter in diameter	10,635 - 10,645

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, crystalline, light- to dark-gray, dolomitic, sandy, with a little interbedded, very dark-gray shale	10,645 - 10,649
9	Dolomite, very fine, crystalline, dark-brownish-gray, somewhat argillaceous, containing a great deal of quartz silt and very fine angular sand	10,649 - 10,658
1	Shale, dark- to very dark-gray, dolomitic	10,658 - 10,659
5	Dolomite, very fine, crystalline, gray to dark-gray, silty	10,659 - 10,664
2	Shale, very dark-gray, silty and dolomitic	10,664 - 10,666
11	Limestone, very fine, crystalline, dark-gray, dolomitic, containing considerable quartz silt and very fine sand	10,666 - 10,677
9	Dolomite, very fine, crystalline, gray to dark-gray, containing considerable very fine angular quartz sand	10,677 - 10,686
3	Sandstone, very fine-grained, light-gray to gray, dolomitic, silty — quartz grains angular	10,686 - 10,689
2	Sandstone, very fine-grained, gray to dark-gray, dolomitic and silty — quartz grains angular	10,689 - 10,691
6	Sandstone, very fine-grained, brownish- to dark-brownish-gray, very dolomitic	10,691 - 10,697
6	Dolomite, very fine, clastic, dark-brownish-gray, sandy and somewhat argillaceous	10,697 - 10,703
5	Limestone, very fine, clastic, dark-gray, dolomitic and somewhat argillaceous and silty	10,703 - 10,708
9	Dolomite, very fine, clastic, dark-brownish-gray, argillaceous and sandy	10,708 - 10,717
11	Limestone, very fine, clastic, dark- to very dark-gray, dolomitic, somewhat argillaceous and silty	10,717 - 10,728
6	Dolomite, very fine, crystalline, dark-gray, somewhat argillaceous, silty and sandy	10,728 - 10,734
9	Dolomite, very fine, clastic, dark-gray, silty and somewhat argillaceous	10,734 - 10,743
4	Limestone, very fine, clastic, dark-gray, dolomitic, sandy and somewhat argillaceous	10,743 - 10,747

Thickness Feet	Description of Strata	Depth in feet
4	Dolomite, very fine, crystalline, dark-brownish-gray, somewhat sandy and argillaceous	10,747 - 10,751
3	Dolomite, very fine, crystalline, dark- to very dark-gray, silty, sandy and somewhat argillaceous	10,751 - 10,754
11	Dolomite, very fine, crystalline, dark- to very dark-brownish-gray, sandy and somewhat argillaceous, containing a very little brownish-gray semichalcedonic chert with silicified oölites in middle part	10,754 - 10,765
3	Dolomite, very fine, crystalline, dark-brownish-gray, somewhat argillaceous, silty and sandy	10,765 - 10,768
3	Limestone, very fine, clastic, dark-gray to very dark-brownish-gray, dolomitic and slightly argillaceous, containing a few fine to medium, angular quartz grains	10,768 - 10,771
5	Limestone, very fine, clastic, very dark-gray, dolomitic, argillaceous and silty	10,771 - 10,776
14	Dolomite, very fine, crystalline, dark-brownish-gray, somewhat argillaceous, silty and sandy	10,776 - 10,790
7	Dolomite, very fine, crystalline, dark-gray, slightly argillaceous and silty	10,790 - 10,797
4	Dolomite, very fine, crystalline, light- to dark-gray, silty and sandy	10,797 - 10,801
3	Dolomite, very fine, crystalline, gray to dark-gray, somewhat argillaceous, silty and sandy, with some interbedded oölitic dolomite — dark gray oölites up to .35 millimeter in diameter imbedded in light-gray matrix	10,801 - 10,804
5	Dolomite, very fine, crystalline, dark- to very dark-gray, somewhat argillaceous, silty and sandy	10,804 - 10,809
10	Dolomite, very fine, clastic, dark- to very dark-gray, argillaceous and silty	10,809 - 10,819
14	Dolomite, very fine, crystalline, dark- to very dark-brownish-gray, argillaceous and silty, containing considerable dark-brownish-gray, spongy chert	10,819 - 10,833
11	Dolomite, very fine, clastic, dark-brownish-gray, somewhat argillaceous, silty and sandy	10,833 - 10,844
2	Dolomite, very fine, crystalline, gray to dark-gray, silty, sandy and somewhat argillaceous	10,844 - 10,846

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
3	Dolomite, very fine, clastic, gray to dark-gray, silty and sandy, with some interbedded dark-gray silty dolomitic shale	10,846 - 10,849
7	Dolomite, very fine, crystalline, gray, silty, containing a few rounded and frosted quartz grains to .5 millimeter in diameter	10,849 - 10,856
17	Dolomite, very fine, crystalline, gray to dark-gray, somewhat argillaceous and silty, with a little interbedded dark-gray shale	10,856 - 10,873
5	Dolomite, very fine, crystalline, gray, somewhat argillaceous and silty	10,873 - 10,878
12	Limestone, very fine, crystalline, light- to dark-gray, dolomitic, silty and sandy, with a little interbedded dark-gray shale	10,878 - 10,890
23	Sandstone, very fine-grained, light-gray to gray, dolomitic, with some interbedded dark-gray shale	10,890 - 10,913
3	Dolomite, very fine, crystalline, light-gray, sandy, quartz grains very fine and angular	10,913 - 10,916
17	Sandstone, very fine-grained, light-gray to gray, very dolomitic, with a little interbedded dark-gray shale	10,916 - 10.933
6	Sandstone, medium-grained, light-gray, very dolomitic, with most of larger quartz grains subrounded to rounded and frosted	10,933 - 10,939
4	Sandstone, very fine- to fine-grained, gray, very dolomitic, some of larger quartz grains subrounded to rounded and frosted	10,939 - 10,943
3	Dolomite, very fine, clastic, dark-gray, sandy and somewhat argillaceous	10,943 - 10,946
4	Dolomite, very fine, clastic, dark-brownish-gray, somewhat argillaceous and sandy, with a few of larger quartz grains subrounded to rounded and frosted	10,946 - 10,950
10	Siltstone, gray to dark-gray, argillaceous and calcareous	10,950 - 10,960
7	Dolomite, very fine, crystalline, light-gray, containing some light-gray semichalcedonic chert and some light-gray tripolitic chert	10,960 - 10,967

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Dolomite, very fine to fine, crystalline, light-gray to gray, containing considerable light- to light-brownish-gray subchalcedonic chert and some light-gray tripolitic chert	10,967 - 10,977
10	Dolomite, fine to medium, crystalline, light-gray, containing considerable light-brownish-gray subchalcedonic chert, some light-gray tripolitic chert and an occasional rounded quartz grain	10,977 - 10,987
4	Dolomite, fine to medium, crystalline, light-gray, containing some light-gray tripolitic and light-brownish-gray subchalcedonic chert and some medium to coarse, rounded and frosted quartz grains	10,987 - 10,991
7	Dolomite, very fine to fine, crystalline, light-gray, containing considerable light-brownish-gray subchalcedonic chert and some light-gray tripolitic chert and medium to coarse, rounded and frosted quartz grains	10,991 - 10,998
9	Dolomite, fine to medium, crystalline, light-gray, containing a considerable quantity of medium to very coarse, rounded and frosted quartz grains and some light-gray tripolitic chert	10,998 - 11,007
8	Dolomite, fine to medium, crystalline, light-gray, containing some medium to coarse, rounded and frosted quartz grains	11,007 - 11,015
8	Dolomite, medium, crystalline, light-gray, containing a considerable quantity of medium to coarse, rounded and frosted quartz grains	11,015 - 11,023
2	Sandstone, medium- to coarse-grained, light-gray, very dolomitic — most of quartz grains are rounded and frosted	11,023 - 11,025
7	Dolomite, medium, crystalline, light-gray, containing a considerable quantity of fine to medium quartz grains, many of which are subrounded and frosted, and some of which possess secondary crystal faces; also considerable light-gray chert with silicified oölites to .25 millimeter in diameter	11,025 - 11,032
22	Dolomite, fine to medium, crystalline, light-gray, containing some fine to medium, subrounded to rounded and frosted quartz grains and some anhydrite	11,032 - 11,054
11	Sandstone, fine- to medium-grained, light-brownish-gray, dolomitic; quartz grains subrounded to rounded and frosted, some possess secondary crystal faces	11,054 - 11,065

Kesselring No. 1

Thickness Feet	Description of Strata	Depth in feet
2	Dolomite, fine, crystalline, brownish-gray, containing some fine to medium quartz grains, some of which possess secondary crystal faces	11,065 - 11,067
4	Dolomite, very fine to fine, crystalline, brownish-gray, containing considerable drusy chert	11,067 - 11,071
3	Dolomite, very fine to fine, crystalline, brownish-gray, containing a considerable quantity of fine to medium, subrounded to rounded and frosted quartz grains, some of which possess secondary crystal faces	11,071 - 11,074
5	Dolomite, very fine to fine, crystalline, gray, containing considerable brownish-gray drusy chert	11,074 - 11,079
9	Dolomite, fine to medium, crystalline, light-brownish-gray, containing a considerable quantity of fine to medium, subrounded to rounded quartz grains, some of which possess secondary crystal faces	11,079 - 11,088
5	Sandstone, fine- to medium-grained, light-gray, almost white, dolomitic, some quartz grains rounded and frosted, many subangular with secondary crystal faces	11,088 - 11,093
6	Dolomite, very fine, crystalline, brownish-gray, with some interbedded fine- to medium-grained light-gray, almost white, dolomitic sandstone	11,093 - 11,099
12	Dolomite, fine to medium, crystalline, light-gray, containing some fine to medium quartz grains, mostly subangular with secondary crystal faces, some rounded and frosted	11,099 - 11,111
11	Dolomite, fine to medium, crystalline, light-brownish-gray, containing a considerable quantity of fine to medium, subrounded to rounded and frosted quartz grains, some of which possess secondary crystal faces SMALL VOLUME SALT WATER at 11,118 feet	11,111 - 11,122
15	Dolomite, fine, crystalline, light-brownish-gray, containing some fine to medium, subrounded to rounded and frosted quartz grains, and some possessing secondary crystal faces	11,122 - 11,137
2	Sandstone, fine- to medium-grained, light-brownish-gray, dolomitic, many of larger quartz grains rounded and frosted, some grains possess secondary crystal faces	11,137 - 11,139
6	Dolomite, fine, crystalline, light-brownish-gray, containing a considerable quantity of very fine to medium quartz grains, some of larger grains subrounded to rounded and frosted, many grains possess secondary crystal faces. LARGE VOLUME SALT WATER AT 11,145 feet	11,139 - 11,145
	TOTAL DEPTH	11,145

WELL-SAMPLE RECORD

NO.

49

WELL-SAMPLE RECORD

KYLE MORSE NO. 1 WELL
UNIVERSAL DELTA DRILLING COMPANY

Chautauqua County, New York, Town of Harmony
Chautauqua Quadrangle: 1.05 miles south of 42° 5' N. Lat. and
.06 mile east of 79° 25' W. Long.

Completed: 1954
Elevation: 1572 feet above sea level
Total depth: 7100 feet
Deepest formation: Theresa
Result: 500 gallons of salt water in 24 hours at 3410 feet in Salina formation; 4,000 cubic feet of gas and 3,500 gallons of salt water per day at 3878-3882 in Lockport dolomite; 30,620 cubic feet of gas per day at 4140 feet in Grimsby; 208,000 cubic feet of gas per day at 4248 feet which had declined to 133,000 cubic feet at 4251 feet in Whirlpool; show of gas at 6669 in Trenton limestone; 60,000 cubic feet of gas at 6880 feet in Tribes Hill; salt water at 6972-6976 in Little Falls dolomite; large flow of salt water at 7088-7100 from Theresa formation.
Samples: 450 to 7100 feet examined by Chas. R. Fettke.

Thickness Feet	Description of strata	Depth in feet
	DEVONIAN SYSTEM, 3157 feet	
	Upper Devonian Series, 2624 feet	
450	No samples	0 - 450
7	Sandstone, very-fine-grained, light-greenish-gray, slightly calcareous	450 - 457
8	Shale, greenish-gray, silty, with a little interbedded light-greenish-gray siltstone containing an occasional shell fragment	457 - 465
24	Siltstone, light-greenish-gray, with some interbedded greenish-gray silty shale	465 - 489
71	Shale, greenish-gray, silty, with some interbedded light-greenish-gray siltstone	489 - 560

Morse No. 1

Thickness Feet	Desoription of Strata	Depth in feet
37	Shale, gray, with some interbedded greenish-gray silty shale	560 - 597
37	Siltstone, light-greenish-gray, with oonsiderable interbedded gray shale	597 - 634
115	Shale, gray, with some interbedded greenish-gray silty shale	634 - 749
12	Shale, greenish-gray, silty, with some interbedded gray shale	749 - 761
51	Shale, gray, with oonsiderable interbedded greenish-gray silty shale	761 - 812
27	Siltstone, greenish-gray, with a little interbedded dark-gray shale	812 - 839
9	Shale, gray, silty	839 - 848
8	Sandstone, very fine grained, light-gray, somewhat argillaceous	848 - 856
2	Shale, dark-gray, silty	856 - 858
10	Shale, gray, with considerable interbedded light-gray siltstone	858 - 868
25	Sandstone, very fine grained, light-gray, somewhat argillaceous	868 - 893
4	Shale, gray	893 - 897
22	Siltstone, light-greenish-gray, containing a little biotite mica, with some interbedded gray shale	897 - 919
20	Shale, gray, with a great deal of interbedded greenish-gray silty shale	919 - 939
10	Sandstone, very fine-grained, light-greenish-gray, containing an oooasional fragment of a shell, with a little interbedded dark-gray somewhat caloareous shale	939 - 949
9	Siltstone, light-greenish-gray	949 - 958
13	Shale, dark-gray, with oonsiderable interbedded greenish-gray, silty shale	958 - 971

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
65	Shale, gray to dark-gray, with a little interbedded greenish-gray silty shale	971 - 1036
36	Shale, gray	1036 - 1072
11	Shale, gray to dark-gray, with a little interbedded gray siltstone	1072 - 1083
11	Siltstone, gray, with considerable interbedded gray to dark-gray shale	1083 - 1094
13	Shale, gray, with considerable interbedded greenish-gray silty shale and a little dark-gray shale	1094 - 1107
32	Siltstone, light-greenish-gray with a little interbedded dark-gray shale in part silty	1107 - 1139
29	Shale, dark-gray, in part silty, with some interbedded gray shale and a little light-gray siltstone	1139 - 1168
16	Shale, dark-gray, in part silty, with some interbedded light-greenish-gray shale	1168 - 1184
23	Shale, dark-gray, in part silty, with a little interbedded light-gray siltstone	1184 - 1207
54	Shale, dark-gray, in part silty, containing an occasional fragment of shell	1207 - 1261
24	Shale, gray	1261 - 1285
23	Shale, gray, with some interbedded gray silty shale	1285 - 1308
21	Shale, dark-gray, silty, with some interbedded gray shale	1308 - 1329
10	Shale, dark-gray, silty, with some interbedded light-gray silty shale	1329 - 1339
22	Shale, gray, with some interbedded dark-gray shale, in part silty	1339 - 1361
35	Shale, dark-gray, in part silty, with a little interbedded greenish-gray silty shale	1361 - 1396
12	Shale, gray to dark-gray, with a little interbedded gray siltstone	1396 - 1408
15	Shale, gray, in part silty, with some interbedded very dark-gray to grayish-black shale	1408 - 1423

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, gray, in part silty and slightly calcareous, with a little interbedded very dark-gray shale	1423 - 1433
12	Shale, greenish-gray, with some interbedded greenish-gray slightly calcareous siltstone and a little dark-gray shale	1433 - 1445
21	Shale, greenish-gray, silty and slightly calcareous, with a little interbedded dark-gray shale	1445 - 1466
12	Shale, gray, with some interbedded greenish-gray silty and slightly calcareous shale and some dark-gray shale	1466 - 1478
17	Shale, very dark-gray, in part silty, with some interbedded greenish-gray silty and slightly calcareous shale	1478 - 1495
38	Shale, gray, with some interbedded, very dark-gray in part silty shale and some greenish-gray silty and slightly calcareous shale	1495 - 1533
11	Shale, very dark-gray to grayish-black, silty, with considerable interbedded greenish-gray silty and in part slightly calcareous shale	1533 - 1544
27	Shale, gray, in part silty, with some interbedded dark-gray shale and a little light-greenish-gray somewhat calcareous siltstone	1544 - 1571
39	Shale, greenish-gray, silty, with some interbedded greenish-gray shale and a little light-gray siltstone	1571 - 1610
23	Shale, dark-gray, with some interbedded very dark-gray shale	1610 - 1633
24	Shale, dark-gray, with some interbedded gray, somewhat calcareous, siltstone	1633 - 1657
41	Shale, gray, in part silty	1657 - 1698
26	Shale, gray, with a little interbedded very dark-gray shale	1698 - 1724
52	Shale, gray, with some interbedded very dark-gray shale	1724 - 1776
29	Shale, very dark-gray, with some interbedded gray shale	1776 - 1805
11	Shale, dark-to very dark-gray, silty with some interbedded light-gray silty shale	1805 - 1816
42	Shale, very dark-gray to grayish-black, silty	1816 - 1858
16	Shale, light-gray, silty, and somewhat calcareous, with some interbedded grayish-black silty shale	1858 - 1874

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
40	Shale, light-gray, silty and in part somewhat calcareous with a little interbedded dark-gray shale	1874 - 1914
27	Shale, greenish-gray, in part silty and slightly calcareous, with a little interbedded dark-gray shale	1914 - 1941
10	Shale, gray, containing some fragments of shells, with a little interbedded dark-gray shale	1941 - 1951
20	Shale, gray, slightly calcareous, with a little interbedded very dark-gray shale	1951 - 1971
12	Shale, grayish-black	1971 - 1983
74	Shale, greenish-gray, in part somewhat calcareous	1983 - 2057
30	Shale, dark-gray, with some interbedded gray shale	2057 - 2087
36	Shale, gray to dark-gray, in part slightly calcareous	2087 - 2123
82	Shale, gray, with some interbedded dark-gray to grayish-black, somewhat calcareous shale	2123 - 2205
34	Shale, greenish-gray, silty and slightly calcareous, with some interbedded dark-gray to grayish-black shale	2205 - 2239
56	Shale, gray, with a little interbedded grayish-black shale	2239 - 2295
86	Shale, gray, with considerable interbedded grayish-black shale	2295 - 2381
36	Shale, gray, with some interbedded dark-gray to grayish-black shale	2381 - 2417
14	Shale, dark-gray to grayish-black	2417 - 2431
92	Shale, grayish-black	2431 - 2523
30	Shale, grayish-black, with considerable interbedded dark-brownish-gray shale	2523 - 2553
22	Shale, gray to dark-gray, somewhat calcareous, with considerable interbedded grayish-black shale	2553 - 2575
11	Shale, dark-gray, in part slightly calcareous	2575 - 2586
38	Shale, dark-gray, with considerable interbedded grayish-black shale	2586 - 2624

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
	Middle Devonian Series, 533 feet	
	Hamilton group, 310 feet	
21	Limestone, very fine, clastic, dark-brownish-gray, argillaceous	2624 - 2645
2	Shale, very dark-brownish-black, calcareous	2645 - 2647
24	Limestone, very fine, clastic, dark-brownish-gray, argillaceous	2647 - 2671
39	Shale, dark-gray, in part calcareous	2671 - 2710
1	Chert, subchalcedonic, light-bluish-gray	2710 - 2711
9	Limestone, very fine, clastic, interbedded light-brownish- and brownish-gray, argillaceous	2711 - 2720
47	Shale, gray to dark-gray, calcareous	2720 - 2767
22	Shale, dark-to very dark-gray, calcareous, containing an occasional brachiopod shell	2767 - 2789
46	Shale, very dark-gray to grayish-black, somewhat calcareous	2789 - 2835
2	Limestone, very fine, clastic, brownish-gray, argillaceous	2835 - 2837
67	Shale, very dark-gray to grayish-black	2837 - 2904
	Onondaga limestone, 223 feet	
10	Limestone, fine, clastic, light-brownish-gray, containing considerable light-brownish-and bluish-gray subchalcedonic chert and a little interbedded brownish-gray micaceous bentonite (Tioga)	2904 - 2914
7	Limestone, very fine, clastic, light-brownish-gray, containing an occasional shell fragment, with a great deal of interbedded light-brownish-gray subchalcedonic chert	2914 - 2921
29	Limestone, very fine to coarse, clastic, mottled light-brownish-to dark-brownish-gray, containing considerable light-brownish-gray subchalcedonic chert	2921 - 2950
35	Limestone, very fine, clastic, light-brownish-to brownish-gray, considerable interbedded light-brownish-to brownish-gray subchalcedonic chert	2950 - 2985

Thickness Feet	Description of Strata	Depth in feet
7	Limestone, very fine, clastic, brownish-gray, containing abundant light-gray tripolitic chert	2985 - 2992
10	Limestone, very fine, clastic, brownish-gray, with considerable interbedded light-bluish-and brownish-gray subchalcedonic chert	2992 - 3002
6	Limestone, coarse, clastic, light-brownish-gray	3002 - 3008
21	Limestone, fine to medium, clastic, mottled, light-and dark-brownish-gray, with some gray chalcedonic chert	3008 - 3029
26	Limestone, very fine, clastic, light-gray to brownish-gray, with some light-bluish-and brownish-gray subchalcedonic chert	3029 - 3055
20	Limestone, fine to coarse, light-to dark-brownish-gray, clastic, containing some fragments of shells and crinoid stems, with some interbedded light-and dark-brownish-gray subchalcedonic chert and light-gray tripolitic chert	3055 - 3075
25	Limestone, fine, clastic, brownish-gray, containing some light-gray tripolitic chert and a great deal of light-bluish-gray subchalcedonic chert. Some of the sub-chalcedonic chert contains minute glauconite grains	3075 - 3100
43	Chert, subchalcedonic, light-gray, calcareous, containing abundant small glauconite grains	3100 - 3143
14	Chert, subchalcedonic, light-brownish-gray, calcareous	3143 - 3157
	SILURIAN SYSTEM, 1103 feet	
	Upper Silurian or Cayugan Series, 553 feet	
	Cobleskill limestone, 7 feet	
7	Limestone, very fine, clastic, dolomitic, brownish-to dark-brownish-gray, argillaceous	3157 - 3164
	Salina group, 446 feet	
31	Anhydrite, very fine, crystalline, brownish-to dark-brownish-gray, argillaceous and calcareous	3164 - 3195
24	Limestone, very fine, clastic, brownish-gray, argillaceous and dolomitic, containing a great deal of very fine, crystalline, light-gray anhydrite	3195 - 3219

Thickness Feet	Description of Strata	Depth in feet
79	Limestone, very fine, clastic, gray to grayish-brown, argillaceous and dolomitic, containing a little very fine crystalline light-gray anhydrite	3219 - 3298
13	Limestone, very fine, sublithographic, light-brownish-gray, argillaceous and somewhat magnesian, containing a little anhydrite	3298 - 3311
20	Dolomite, very fine, dense, light-to dark-brownish-gray, argillaceous, containing some very fine, crystalline, light-gray anhydrite	3311 - 3331
46	Limestone, very fine, clastic, light-brownish-to brownish-gray, argillaceous and somewhat dolomitic, containing a little anhydrite	3331 - 3377
39	Limestone, very fine, crystalline, light-brownish-to brownish-gray, containing a little anhydrite, 500 gallons of salt water in 24 hours at 3410 feet	3377 - 3416
35	Dolomite, very fine, sublithographic, light-brownish-to brownish-gray, argillaceous, containing considerable very fine, crystalline, light-gray anhydrite and an occasional subrounded quartz grain	3416 - 3451
80	Shale, greenish-gray, somewhat dolomitic, with some interbedded very fine, clastic, brownish-gray dolomitic limestone and very fine-crystalline, light-gray anhydrite	3451 - 3531
179	Dolomite, very fine, clastic, light-to dark-brownish-gray, argillaceous, containing a little anhydrite, with some interbedded greenish-gray shale	3531 - 3710
	Middle Silurian or Niagaran Series, 388 feet	
	Lockport-Guelph group, 262 feet	
43	Limestone, very fine, crystalline, light-brownish-to dark-brownish-gray, dolomitic	3710 - 3753
13	Limestone, very fine, crystalline, light-brownish-gray, dolomitic	3753 - 3766
33	Dolomite, very fine, crystalline, brownish-gray	3766 - 3799
35	Dolomite, very fine, crystalline, dark-brownish-gray	3799 - 3834

Thickness Feet	Description of Strata	Depth in feet
18	Dolomite, very fine to fine, cyrstalline, brownish-gray	3834 - 3852
70	No samples: 4,000 cubic feet of gas and 3500 gallons salt water per day 3878-3882'	3852 - 3922
5	Limestone, very fine, crystalline, light-brownish-gray, dolomitic and slightly argillaceous	3922 - 3927
15	Dolomite, very fine, crystalline, dark-brownish-gray, argillaceous	2927 - 3942
3	Shale, dark-gray, somewhat dolomitio	3942 - 3945
27	Limestone, very fine, crystalline, brownish-gray, argillaceous, silty and dolomitic, with an occasional rounded and frosted quartz grain to .1 mm. in diameter in lower part	3945 - 3972
	Clinton group, 126 feet	
30	No samples	3972 - 4002
61	Shale, gray, silty and somewhat dolomitio	4002 - 4063
13	Shale, gray, argillaceous and silty, somewhat dolomitic, with some interbedded light-gray dolomitic siltstone	4063 - 4076
22	Dolomite, fine-to medium-crystalline, light-buff, with a little interbedded greenish-gray shale	4076 - 4098
	Lower Silurian or Albion Series, 162 feet	
	Grimsby member, 93 feet	
1	Sandstone, very fine-grained, light-gray to light-reddish-gray, with a little interbedded greenish-gray shale	4098 - 4099
4	Shale, brick-red, silty, with considerable interbedded, very fine-grained, light-gray sandstone	4099 - 4103
5	Sandstone, very fine-to fine-grained, light-gray, to light-reddish-gray	4103 - 4108
8	Sandstone, very fine-to fine-grained, grayish-red, somewhat argillaceous, with a little interbedded brick-red shale	4108 - 4116
53	Sandstone, very fine-to fine-grained, light-pink to pink, somewhat argillaceous, with a little interbedded reddish-gray silty shale; 30,620 cubic feet of gas per day at 4140 feet	4116 - 4169

Thickness Feet	Description of Strata	Depth in Feet
10	Sandstone, very fine-to fine-grained, light-pink, quartzose, with some interbedded reddish-gray silty shale	4169-4179
12	Sandstone, very fine-to fine-grained, light-gray, quartzose, with some interbedded reddish-gray silty shale	4179-4191
	Cabot Head shale, 54 feet	
10	Siltstone, light-greenish-gray with some interbedded greenish-gray silty shale	4191-4201
7	Sandstone, very fine-grained, light-greenish-gray, with a little interbedded greenish-gray shale	4201-4208
37	Shale, gray to dark-gray, with a little interbedded light-greenish-gray siltstone	4208-4245
	Whirlpool member, 15 feet	
9	Sandstone, very fine, light-gray, almost white quartzitic, 208,000 cubic feet of gas at 4248, had declined to 133,000 cubic feet at 4251 feet, hydrafracing not successful	4245-4254
6	Shale, greenish-gray	4254-4260
	ORDOVICIAN SYSTEM, 2689 feet	
	Upper Ordovician or Cincinnatian Series, 1885 feet	
	Queenston shale, 1030 feet	
153	Shale, brick-red, with a little interbedded greenish-gray shale	4260-4413
127	Shale, brick-red, in part silty	4413-4540
33	Shale, brick-red, slightly calcareous	4540-4573
300	Shale, brick-red, silty, slightly calcareous	4573-4873
1	Sandstone, very fine-grained, brick-red, argillaceous	4873-4874
7	Shale, brick-red, silty and sandy, slightly calcareous	4874-4881
8	Siltstone, reddish-brown, slightly calcareous	4881-4889

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
6	Sandstone, very fine-grained, reddish-brown, argillaceous and slightly calcareous, with a little interbedded, very fine-grained, greenish-gray argillaceous and slightly calcareous sandstone	4889 - 4895
5	Siltstone, reddish-brown, slightly calcareous	4895 - 4900
19	Siltstone, reddish-brown, slightly calcareous, with a little interbedded brick-red shale	4900 - 4919
17	Sandstone, very fine-grained, reddish-brown, argillaceous	4919 - 4936
21	Siltstone, reddish-brown, with a little interbedded brick-red shale	4936 - 4957
8	Sandstone, very fine-grained, reddish-brown, argillaceous	4957 - 4965
23	Shale, reddish-brown, silty	4965 - 4988
4	Sandstone, very fine, reddish-brown, argillaceous	4988 - 4992
8	Shale, reddish-brown, sandy	4992 - 5000
5	Sandstone, very fine, reddish-brown, argillaceous and slightly calcareous	5000 - 5005
27	Shale, reddish-brown, in part silty	5005 - 5032
7	Sandstone, very fine-grained, reddish-brown	5032 - 5039
15	Siltstone, reddish-brown, with a little interbedded brick-red shale	5039 - 5054
26	Shale, reddish-brown, silty	5054 - 5080
5	Siltstone, reddish-brown, with a little interbedded grayish-green shale	5080 - 5085
5	Sandstone, very fine-grained, reddish-brown, argillaceous, with a little interbedded brick-red and grayish-green shale	5085 - 5090
24	Shale, reddish-gray, silty with some interbedded greenish-gray silty shale	5090 - 5114
22	Siltstone, greenish-gray, with some interbedded reddish-gray siltstone	5114 - 5136

Thickness Feet	Description of Strata	Depth in feet
98	Shale, grayish-green, in part silty, with a little interbedded brick-red silty shale	5136 - 5234
36	Shale, brick-red, with some interbedded grayish-green shale, in part silty	5234 - 5270
15	Shale, grayish-green, with considerable interbedded brick-red shale	5270 - 5285
5	Shale, brick-red, with a great deal of interbedded grayish-green shale	5285 - 5290
	Lorraine shale, 533 feet	
185	Shale, greenish-gray, with a little interbedded greenish-gray, slightly calcareous siltstone	5290 - 5475
57	Shale, greenish-gray, with a little interbedded light-gray, somewhat calcareous siltstone containing occasional fragments of shells	5475 - 5532
291	Shale, gray to dark-gray, with a little interbedded gray somewhat calcareous siltstone containing fragments of shells	5532 - 5823
	Utica shale, 322 feet	
19	Shale, gray to dark-gray, somewhat calcareous with a little interbedded gray calcareous siltstone	5823 - 5842
10	Shale, gray to dark-gray, slightly calcareous	5842 - 5852
59	Shale, gray to dark-gray, very slightly calcareous, with a little interbedded gray slightly calcareous silty shale	5852 - 5911
214	Shale, gray to dark-gray, with a little interbedded gray calcareous siltstone	5911 - 6125
7	Shale, gray to dark-gray, with a very little interbedded grayish-black shale and a little gray somewhat calcareous siltstone	6125 - 6132
13	Shale, gray to dark-gray, with a little interbedded gray, somewhat calcareous siltstone	6132 - 6145
	Middle Ordovician or Champlainian Series, 731 feet	
	Top Trenton limestone	6145

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Shale, gray, somewhat calcareous, containing an occasional shell fragment with a little interbedded gray, argillaceous limestone	6145 - 6150
14	Shale, gray, somewhat calcareous, with a little interbedded, very fine-to coarse-bioclastic gray limestone containing abundant small shell fragments	6150 - 6164
6	Shale, gray, somewhat calcareous, with some interbedded coarse bioclastic, gray limestone containing abundant fragments of shells	6164 - 6170
25	Shale, gray, slightly calcareous, with considerable interbedded coarse, bioclastic, brownish-gray limestone containing abundant fragments of shells	6170 - 6195
40	Limestone, coarse, bioclastic, mottled light-and dark-brownish-gray, argillaceous, containing abundant fragments of shells	6195 - 6235
63	Limestone, very fine to coarse, clastic, brownish-gray to dark-gray, argillaceous, containing abundant fragments of shells	6235 - 6298
27	Limestone, very fine, clastic, brownish-gray to dark-gray, argillaceous, containing some shell fragments	6298 - 6325
29	Limestone, very fine, clastic, shaly, dark gray, containing an occasional shell fragment	6325 - 6354
53	Limestone, very fine, clastic, very dark-gray, argillaceous	6354 - 6407
7	Limestone, very fine, clastic, brownish-gray, argillaceous, containing occasional fragments of shells	6407 - 6414
49	Limestone, very fine, clastic, brownish-gray, containing fragments of shells, with considerable interbedded very dark-gray to grayish-black shaly limestone	6414 - 6463
43	Limestone, coarse, bioclastic, light-brownish-gray, containing abundant fragments of shells, with some interbedded, very fine, clastic, dark-gray limestone containing an occasional shell fragment	6463 - 6506
26	Limestone, very fine to coarse, bioclastic, brownish-to dark-brownish-gray, argillaceous, abundant fragments of shells and a little gray subchalcedonic chert	6506 - 6532

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
40	Limestone, very fine to coarse, clastic, light-brownish- to brownish-gray, somewhat argillaceous, containing fragments of shells	6532 - 6572
18	Limestone, very fine, clastic, light-brownish-gray, somewhat argillaceous	6572 - 6590
40	Limestone, very fine, sublithographic, light-brownish-to brownish-gray, somewhat argillaceous, containing an occasional shell fragment	6590 - 6630
10	Limestone, very fine, clastic, brownish-gray, argillaceous	6630 - 6640
48	Limestone, very fine, sublithographic, light-brownish-to brownish-gray, somewhat argillaceous and magnesian, containing an occasional shell fragment. Show of gas at 6669	6640 - 6688
24	Limestone, very fine, clastic, brownish-gray, somewhat argillaceous and magnesian	6688 - 6712
5	Shale, greenish-gray, calcareous, with some interbedded very fine, clastic, brownish-gray limestone	6712 - 6717
25	Limestone, very fine, clastic, brownish-gray, somewhat argillaceous	6717 - 6742
10	Limestone, very fine, sublithographic, brownish-gray, containing some fragments of shells	6742 - 6752
7	Shale, gray, slightly calcareous	6752 - 6759
10	Limestone, very fine, sublithographic, brownish-gray	6759 - 6769
16	Shale, greenish-gray, with some interbedded, very fine to fine, clastic, brownish-to dark-brownish-gray, argillaceous limestone containing an occasional shell fragment	6769 - 6785
38	Limestone, very fine, sublithographic, brownish-gray, containing an occasional shell fragment in lower part	6785 - 6823
6	Limestone, very fine to fine, clastic, brownish-to dark-brownish-gray, argillaceous	6823 - 6829
43	Limestone, very fine, sublithographic, light-gray	6829 - 6872
4	Limestone, very fine, clastic, light-gray to brownish-gray, somewhat argillaceous	6872 - 6876

Thickness Feet	Description of Strata	Depth in feet
	Lower Ordovician or Canadian Series, 73 feet	
	Tribes Hill limestone, 73 feet	
6	Dolomite, very fine, crystalline, light-gray to light-brownish-gray, somewhat argillaceous, 60,000 cubic feet of gas per day at 6880 feet and slight show of oil	6876 - 6882
12	Limestone, very fine, crystalline, brownish-gray, silty and dolomitic, containing some rounded and frosted quartz grains to 1.0 millimeter in diameter, with a little interbedded, slightly calcareous, greenish-gray shale	6882 - 6894
6	Dolomite, very fine, gray-to dark-gray, silty, with a little interbedded gray shale	6894 - 6900
14	Limestone, very fine, clastic, gray, silty, somewhat magnesian, containing a few medium-rounded and frosted quartz grains up to .7 millimeter in diameter, with some interbedded greenish-gray to gray, slightly calcareous shale	6900 - 6914
15	Siltstone, light-gray, calcareous, containing an occasional fine to medium, rounded and frosted quartz grains	6914 - 6929
20	Limestone, very fine, crystalline, light-gray, somewhat magnesian, with considerable interbedded greenish-gray, slightly calcareous shale	6929 - 6949
	CAMBRIAN SYSTEM, 151+ feet	
	Upper Cambrian Series, 151+ feet	
	Little Falls dolomite, 83 feet	
41	Dolomite, very fine, crystalline, light-gray, somewhat silty and argillaceous. Salt water 6972-6976	6949 - 6990
24	Dolomite, fine, crystalline, light-brownish-gray, silty, and argillaceous	6990 - 7014
18	Dolomite, very fine, crystalline, brownish-to brownish-gray, somewhat silty, containing an occasional minute gastropod shell	7014 - 7032

Morse No. 1

Thickness Feet	Description of Strata	Depth in feet
	Theresa formation	
4	Sandstone, fine-grained, gray, dolomitic, with some medium rounded and frosted quartz grains and some grains with secondary crystal faces	7032 - 7036
4	Dolomite, fine, sandy, containing a considerable quantity of fine-to medium-rounded and frosted quartz grains	7036 - 7040
5	Dolomite, fine, crystalline, brownish-gray, containing a considerable quantity of fine-to medium-rounded and frosted quartz grains	7040 - 7045
13	Dolomite, very fine to fine, crystalline, brownish-gray, containing considerable very fine to fine quartz sand	7045 - 7058
30	Sandstone, very fine to fine, brownish-gray, dolomitic	7058 - 7088
12	Sandstone, fine to medium-grained, light-gray, quartzose and dolomitic, with many of quartz grains rounded and frosted, secondary crystal faces common; large flow of salt water	7088 - 7100
	TOTAL DEPTH	7100

WELL-SAMPLE RECORD

NO.

50

WELL-SAMPLE RECORD

G. W. Crile No. 1 Well

East Ohio Gas Company

Geauga County, Ohio; Chardon Township, Lot 1
Mentor Quadrangle, 2.30 miles south of 41° 40', N. Lat. and .30 mile west of 81° 15' W. Long.
Completed: February 11, 1941
Elevation: 1031 feet above sea-level
Total Depth: 6101 feet
Deepest formation: Eau Claire
Result: 10,000 cubic feet of gas per day at 2144-2150 feet in Oriskany, show of salt water at 2150 feet in Oriskany; show of gas and oil at 3090-3093 in Lockport, salt water rose 600 feet at 3100 in Lockport salt water at 6000 feet in Eau Claire
Samples: 716 to 6101 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 2151 feet	
	Upper Devonian Series, 1636+ feet	
	Chagrin formation, 132+ feet	
716	No samples	0 - 716
43	Shale, very dark-gray	716 - 759
8	Shale, dark-gray, with some interbedded gray silty shale	759 - 767
25	Shale, dark-gray, containing minute pyrite pellets	767 - 792
25	Shale, dark-gray, with considerable interbedded greenish-gray silty shale containing some muscovite	792 - 817
23	Shale, greenish-gray, silty, containing some muscovite, with considerable interbedded dark-gray shale	817 - 840

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, dark- to very dark-gray, with considerable interbedded greenish-gray silty shale containing some muscovite	840 - 848
9	Shale, greenish-gray, silty, containing some muscovite, with some interbedded dark-gray shale	848 - 857
8	Shale, dark-gray, with some interbedded greenish-gray, silty shale	857 - 865
39	Shale, greenish-gray, silty, containing some muscovite, with some interbedded dark- to very dark-gray shale	865 - 904
	Huron shale, 732 feet	
56	Shale, dark- to very dark-gray	904 - 960
23	Shale, dark-gray with a little interbedded greenish-gray silty shale	960 - 983
7	Shale, dark- to very dark-gray	983 - 990
9	Siltstone, brownish-gray, with some interbedded very dark-gray shale	990 - 999
8	Shale, very dark-gray, with considerable interbedded greenish-gray siltstone	999 - 1007
35	Shale, very dark-gray, with some interbedded greenish-gray silty shale	1007 - 1042
8	Shale, gray to dark-gray	1042 - 1050
8	Shale, very dark-gray, with some interbedded greenish-gray silty shale	1050 - 1058
10	Shale, grayish-black	1058 - 1068
261	No samples	1068 - 1329
9	Shale, very dark-gray to grayish-black	1329 - 1338
66	Shale, grayish-black	1338 - 1404
9	Shale, grayish-black with some interbedded gray shale	1404 - 1413
9	Shale, grayish-black	1413 - 1422
8	Shale, very dark-gray to grayish-black	1422 - 1430
38	Shale, grayish-black	1430 - 1468
14	Shale, gray to dark-gray	1468 - 1482

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
8	Shale, gray, silty, slightly calcareous with considerable interbedded dark-gray shale	1482 - 1490
7	Shale, greenish-gray	1490 - 1497
7	Shale, very dark-gray	1497 - 1504
7	Shale, grayish-black, with some interbedded dark-gray shale	1504 - 1511
11	Shale, gray, silty, slightly calcareous, containing an occasional shell fragment, with considerable interbedded dark- to very dark-gray shale	1511 - 1522
35	Shale, grayish-black, with a little interbedded dark-gray shale	1522 - 1557
14	Shale, gray, slightly calcareous, with some interbedded very dark-gray shale	1557 - 1571
6	Shale, very dark-gray, with considerable interbedded gray, slightly calcareous shale	1571 - 1577
59	Shale, grayish-black	1577 - 1636
	Middle Devonian Series, 503 feet	
	Olentangy shale, 155 feet	
14	Shale, gray, slightly calcareous	1636 - 1650
70	Shale, dark-gray, slightly calcareous, containing spore cases and an occasional shell fragment	1650 - 1720
50	Shale, very dark-gray, slightly calcareous, containing spore cases	1720 - 1770
21	Shale, black	1770 - 1791
	Delaware limestone, 18 feet	
18	Limestone, very fine, dense, gray, argillaceous, containing abundant fragments of shells	1791 - 1809
	Onondaga limestone, 330 feet	
26	Limestone, very fine, dense, light-gray, somewhat argillaceous, containing some light-gray to brownish-gray chert, occasional fragments of shells	1809 - 1835

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
17	Limestone, very fine, dense, light-gray, slightly argillaceous, containing a little light-gray chert with dolocasts	1835 - 1852
25	Limestone, very fine, dense, gray, slightly argillaceous, containing a little light-gray chert with dolocasts and some fragments of shells	1852 - 1877
54	Limestone, very fine, dense, light-brownish-gray, slightly argillaceous, containing some light-gray to brownish-gray chert with dolocasts and fragments of shells	1877 - 1931
14	Limestone, very fine, dense, brownish- to dark-brownish-gray, slightly argillaceous, containing some brownish-gray chert and fragments of shells	1931 - 1945
47	Limestone, very fine, dense, light-brownish-gray, containing considerable light-gray chert	1945 - 1992
24	Limestone, very fine, dense, light- to dark-brownish-gray, containing considerable light-gray chert and fragments of shells	1992 - 2016
89	Limestone, very fine, dense, light-brownish-gray, containing a great deal of light-gray chert with dolocasts and occasional fragments of shells	2016 - 2105
34	Limestone, very fine, crystalline, light-brownish- to brownish-gray, dolomitic, containing a great deal of light-gray chert	2105 - 2139
	Lower Devonian Series, 12 feet	
	Oriskany sandstone, 12 feet	
12	Sandstone, fine- to medium-grained, light-brownish-gray, dolomitic; some of quartz grains rounded and frosted, others possess secondary crystal faces; 10,000 cubic feet of gas per day at 2144-2150 feet and show of salt water at 2150 feet	2139 - 2151
	SILURIAN SYSTEM, 1474 feet	
	Upper Silurian or Cayugan Series, 739 feet	
	Cobleskill limestone, 161 feet	
60	Limestone, very fine, crystalline, light-brownish- to brownish-gray, somewhat argillaceous and magnesian, containing fragments of shells	2151 - 2211

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Limestone, very fine, crystalline, brownish- to dark-brownish-gray, somewhat argillaceous and magnesian	2211 - 2220
65	Dolomite, very fine crystalline, light-brownish-gray, somewhat argillaceous	2220 - 2285
27	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic	2285 - 2312
	Salina formation, 739 feet	
11	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and dolomitic, with considerable interbedded very fine-crystalline, light-gray anhydrite	2312 - 2323
20	Limestone, very fine, dense, very dark-brownish-gray, dolomitic and slightly argillaceous, with a great deal of interbedded very fine-crystalline, light-brownish-gray anhydrite	2323 - 2343
6	Anhydrite, very fine-crystalline, brownish-gray - set 8¼" casing at 2349	2343 - 2349
22	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and dolomitic, with considerable interbedded very fine, crystalline, brownish-gray anhydrite	2349 - 2371
42	Limestone, very fine, dense, gray, argillaceous and dolomitic, with some interbedded, very fine-crystalline, brownish-gray anhydrite	2371 - 2413
8	Anhydrite, very fine, crystalline, light-brownish-gray	2413 - 2421
49	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and dolomitic, with some interbedded very fine, crystalline, light-brownish-gray anhydrite	2421 - 2470
36	Limestone, very fine, dense, light-brownish-gray, argillaceous and dolomitic, with considerable interbedded salt	2470 - 2506
30	Limestone, very fine, dense, light-brownish-gray, magnesian, and slightly argillaceous, with a great deal of interbedded very fine crystalline, light-brownish-gray anhydrite	2506 - 2536
74	Salt, medium-crystalline, colorless	2536 - 2610
35	Limestone, very fine, dense, light-brownish-gray, slightly argillaceous and magnesian, with a great deal of interbedded very fine-crystalline, light-gray anhydrite	2610 - 2645
22	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, with some interbedded anhydrite and a little gray, somewhat dolomitic shale	2645 - 2667

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
48	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, with some interbedded anhydrite	2667 - 2715
28	Clay, brownish-gray, somewhat dolomitic, with some interbedded salt and a little anhydrite	2715 - 2743
9	Limestone, very fine, dense, light-grayish-brown, argillaceous and dolomitic, with a little interbedded anhydrite	2743 - 2752
13	Shale, dark-gray, somewhat dolomitic	2752 - 2765
41	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, with some interbedded gray, somewhat dolomitic shale and a little anhydrite	2765 - 2806
72	Limestone, very fine, dense, brownish-gray, argillaceous and magnesian, with a great deal of interbedded very fine-crystalline, light-brownish-gray anhydrite	2806 - 2878
15	Clay, brownish-gray, dolomitic, with considerable interbedded salt	2878 - 2893
10	Salt, medium-crystalline, colorless	2893 - 2903
25	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, with a little interbedded anhydrite	2903 - 2928
14	Salt, medium-crystalline, colorless, with some interbedded brownish-gray, dolomitic clay	2928 - 2942
58	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and somewhat magnesian, with some interbedded very fine, crystalline, brownish- to dark-brownish-gray anhydrite	2942 - 3000
27	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, with a little interbedded anhydrite	3000 - 3027
24	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, with a great deal of interbedded very fine-crystalline, light-brownish-gray anhydrite	3027 - 3051
	Middle Silurian Series, 574 feet	
	Lockport-Guelph group, 296 feet	
13	Limestone, fine-crystalline, grayish-brown, dolomitic	3051 - 3064
45	Limestone, fine-crystalline, light-brownish-gray, dolomitic; show of gas and oil at 3090, salt water at 3100	3064 - 3109

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
14	Dolomite, fine-crystalline, light-gray	3109 - 3123
50	Limestone, very fine-crystalline, light-gray, dolomitic	3123 - 3173
10	Limestone, fine-crystalline, light-brownish-gray, dolomitic	3173 - 3183
64	Limestone, very fine-crystalline, light-gray to light-brownish-gray	3183 - 3247
40	Limestone, fine-crystalline, grayish-brown, dolomitic	3247 - 3287
18	Limestone, very fine-crystalline, dark-brownish-gray, dolomitic	3287 - 3305
42	Limestone, fine-crystalline, light-gray, dolomitic	3305 - 3347
	Clinton group, 103 feet	
30	Shale, gray, dolomitic	3347 - 3377
15	Limestone, very fine, argillaceous, silty and slightly magnesian, with considerable interbedded gray, slightly calcareous shale	3377 - 3392
8	Shale, gray, slightly calcareous	3392 - 3400
22	Shale, gray, slightly calcareous, with considerable interbedded very fine, argillaceous, silty and slightly magnesian limestone	3400 - 3422
8	Limestone, very fine, dense, brownish-gray, argillaceous, silty and somewhat magnesian	3422 - 3430
8	Stiltstone, greenish-gray, with some interbedded grayish-green shale	3430 - 3438
12	Shale, gray, with some interbedded very fine-crystalline, light-gray, silty and slightly magnesian limestone	3438 - 3450
	Lower Silurian or Albion Series, 175 feet	
11	Shale, brick-red, silty, with some interbedded greenish-gray silty shale and some very fine-grained, light-gray sandstone	3450 - 3461
9	Shale, brick-red, silty, with some interbedded very fine-grained, light-gray sandstone	3461 - 3470
35	Shale, brick-red, sandy	3470 - 3505
14	Shale, greenish-gray, silty	3505 - 3519
4	Sandstone, very fine-grained, light-gray to reddish-gray	3519 - 3523

Crile No. 1

Thickness Feet	Description of Strata	Depth in fee
5	Sandstone, very fine-grained, light-gray	3523 - 3528
22	Shale, gray, with a little interbedded very fine-grained, light-gray sandstone	3528 - 3550
11	Shale, gray, with considerable interbedded greenish-gray silty shale	3550 - 3561
37	Shale, gray, with a little interbedded light-greenish-gray siltstone	3561 - 3598
22	Shale, gray, with some interbedded greenish-gray, somewhat calcareous siltstone	3598 - 3620
5	Sandstone, very fine-grained, light-gray	3620 - 3625
	ORDOVIDIAN SYSTEM, 2293 feet	
	Upper Ordovician or Cincinnatian Series, 1358 feet	
	Top of Queenston shale	3625
26	Shale, brick-red, with a little interbedded greenish-gray shale	3625 - 3651
12	Shale, brick-red	3651 - 3663
13	Shale, brick-red, with a little interbedded grayish-green shale	3663 - 3676
334	No samples	3676 - 4010
60	Shale, brick-red, with a little interbedded light-greenish-gray, slightly calcareous siltstone	4010 - 4070
60	Shale, brick-red, slightly calcareous	4070 - 4130
10	Shale, brick-red, slightly calcareous, with considerable interbedded greenish-gray shale	4130 - 4140
	Bottom of Queenston shale	4140
15	Shale, dark-gray, with some interbedded greenish-gray, somewhat calcareous siltstone	4140 - 4155
6	Shale, dark-gray, with considerable interbedded greenish-gray, somewhat calcareous siltstone containing fragments of shells and a little brick-red shale	4155 - 4161
45	Shale, dark-gray, with a little interbedded brick-red shale and gray, somewhat calcareous siltstone containing an occasional shell fragment	4161 - 4206

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
44	Shale, gray to dark-gray, with considerable interbedded greenish-gray, slightly calcareous siltstone	4206 - 4250
10	Siltstone, gray, somewhat calcareous, with some interbedded dark-gray shale	4250 - 4260
275	Shale, dark-gray, with a little interbedded gray to greenish-gray, somewhat calcareous siltstone containing fragments of shells	4260 - 4535
87	Shale, dark-gray, slightly calcareous, containing an occasional shell fragment	4535 - 4622
53	Shale, dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	4622 - 4675
40	Shale, dark-gray, slightly calcareous, containing fragments of shells	4675 - 4715
105	Shale, dark- to very dark-gray, slightly calcareous	4715 - 4820
102	Shale, very dark-gray, slightly calcareous	4820 - 4922
61	Shale, very dark-gray, almost black, slightly calcareous	4922 - 4983
87	Shale, grayish-black, slightly calcareous	4983 - 5070
150	Shale, grayish-black, calcareous	5070 - 5220
40	Shale, grayish-black, very calcareous, with a little interbedded very fine, dense, dark-brownish-gray, argillaceous limestone	5220 - 5260
	Middle Ordovician or Champlainian Series, 658 feet	
	Top of Trenton limestone	5260
53	Limestone, very fine, crystalline, mottled light- and dark-brownish-gray, somewhat argillaceous and slightly magnesian containing abundant fragments of shells, and a very little light-gray chert, with a little interbedded grayish-black, very calcareous shale	5260 - 5313
44	Limestone, very fine, crystalline, mottled light- and dark-brownish-gray, somewhat argillaceous and slightly magnesian, containing fragments of shells and a little light-brownish-gray chert, with some interbedded very dark-gray, calcareous shale containing fragments of shells	5313 - 5357

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
13	Limestone, very fine, crystalline, dark-grayish-brown, containing fragments of shells	5357 - 5370
94	Limestone, very fine, dense, light-brownish- to brownish-gray, somewhat argillaceous and slightly magnesian, containing fragments of shells, and a little light-brownish-gray chert	5370 - 5464
96	Limestone. very fine, dense, brownish- to dark-brownish-gray, somewhat argillaceous and slightly magnesian	5464 - 5560
68	Limestone, very fine, in part dense and in part crystalline, brownish- to dark-brownish-gray, somewhat argillaceous and slightly magnesian, containing fragments of shells	5560 - 5628
25	Limestone, very fine, dense, platy, brownish-gray, somewhat argillaceous and slightly magnesian, containing fragments of shells, with some interbedded gray bentonite, containing some biotite	5628 - 5653
72	Limestone, very fine, dense, light-brownish-gray, somewhat magnesian	5653 - 5725
69	Limestone, very fine, dense, brownish-gray, argillaceous and magnesian, containing fragments of shells	5725 - 5794
26	Limestone, very fine, dense, brownish-gray, argillaceous and slightly magnesian, with a little interbedded grayish-green, somewhat calcareous shale	5794 - 5820
15	Limestone, very fine, dense, light- to dark-brownish-gray, containing fragments of shells	5820 - 5835
28	Limestone, very fine, dense, brownish-gray, somewhat argillaceous and magnesian, with a little interbedded light-gray bentonite	5835 - 5863
44	Limestone, very fine, dense, dark-brownish-gray, somewhat argillaceous and slightly magnesian, containing a few medium-sized rounded and frosted quartz grains, with some interbedded gray and greenish-gray shale	5863 - 5907
11	Shale, gray and greenish-gray, calcareous	5907 - 5918

CAMBRIAN SYSTEM, 183+ feet

Upper Cambrian Series, 183+ feet

Dresbach sandstone, 5 feet

Crile No. 1

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, medium-grained, white, dolomitic, with many of the quartz grains rounded and frosted	5918 - 592?
	Eau Claire sandstone, 178 feet	
8	Limestone, very fine, crystalline, light-grayish-brown, dolomitic and sandy, with medium-sized quartz grains, many of which are rounded and frosted	5923 - 5931
36	Limestone, fine, crystalline, light-brownish-gray, dolomitic and sandy, with fine- to medium-sized quartz grains, some of the larger of which are rounded and frosted, others angular	5931 - 5967
11	Limestone, fine, crystalline, light-gray, dolomitic and sandy, with very fine- to fine angular quartz grains, only a few of the larger of which are rounded and frosted	5967 - 5978
61	Limestone, fine-crystalline, light-brownish-gray, dolomitic and somewhat sandy, with very fine- to fine angular quartz grains, only a few of the larger of which are rounded and frosted; salt water at 6000 feet	5978 - 6039
31	Limestone, fine-crystalline, light-brownish-gray, sandy and somewhat magnesian, with fine- to medium-sized quartz grains, the latter of which are mostly rounded and frosted	6039 - 6070
31	Limestone, fine-crystalline, brownish-gray, very sandy and slightly magnesian, with fine- to medium-sized quartz grains, the latter are mostly rounded and frosted	6070 - 6101
	TOTAL DEPTH	6101

WELL-SAMPLE RECORD

NO.

51

WELL-SAMPLE RECORD

J. H. ARMSTRONG NO. 8 WELL

Ohio Oil Company

Wayne County, Ohio, Wooster Twp. Wooster Quadrangle: 1.78 mile north of 40° 45' N. Lat. and .65 mile east of 81° 55' W. Long.
Completed: July 1, 1941
Elevation: 1119 feet above sea-level
Total Depth: 6116 feet
Deepest formation: Trempealeau
Result: First saltwater at 2447 in Bass Island; one barrel of saltwater per hour, 3129-3139, from Lockport; show of gas at 3410-3414 in Clinton; show of gas at 3464-3468; show of oil and gas at 3511, and show of oil at 3535 in Albion; show of oil 5024-5030 and 5049-5053 in Trenton, acidized without results; show of oil and gas at 5763-5767, and show of oil at 5799-5802 in Trempealeau; shot without results; saltwater at 6017-6032, and 6071-6083 in Trempealeau; saltwater rose 3,000 feet in hole and could not be bailed down.

Samples: 600 to 6116 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 852+ feet	
500	No samples	0 - 500
50	Shale, gray, silty and in part slightly calcareous	500 - 550
20	Shale, gray, containing occasional fragments of crinoid stems	550 - 570
50	No samples	570 - 620
5	Shale, gray, with considerable interbedded, greenish-gray, silty and micaceous shale	620 - 625

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
25	No samples	625 - 650
5	Shale, dark-gray	650 - 655
20	No samples	655 - 675
5	Shale, dark-gray	675 - 680
75	No samples	680 - 755
	Berea sandstone, 21 feet	
21	Sandstone, very fine-grained, light-greenish-gray, very slightly calcareous, containing a little biotite and muscovite, some interbedded dark-gray shale containing a few minute fragments of plant remains	755 - 776
	Bedford shale, 76 feet	
4	Shale, gray	776 - 780
47	No samples	780 - 827
25	Shale, gray- to dark-gray, silty	827 - 852
	DEVONIAN SYSTEM, 1521 feet	
	Upper Devonian Series, 998 feet	
	Chagrin shale, 601 feet	
48	Shale, gray- to very dark-gray, silty	852 - 900
45	Shale, gray- to dark-gray	900 - 945
10	Shale, dark-gray, with some interbedded greenish-gray silty shale	945 - 955
20	Shale, gray- to dark-gray, containing some minute fragments of carbonized plant remains	955 - 975
10	Shale, dark-gray, with considerable interbedded greenish-gray silty shale containing some muscovite	975 - 985
7	Shale, gray- to dark-gray	985 - 992
24	Shale, dark- to very dark-gray, in part silty	992 - 1016

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
6	Shale, gray- to dark-gray	1016 - 1022
36	Shale, dark-gray, with some interbedded greenish-gray siltstone, containing both biotite and muscovite	1022 - 1058
8	Siltstone, greenish-gray, containing some biotite and muscovite, with a little interbedded dark-gray shale	1058 - 1066
34	Shale, dark-gray, with a great deal of interbedded greenish-gray siltstone containing some biotite and muscovite.	1066 - 1100
38	Shale, gray- to dark-gray with considerable interbedded greenish-gray silty shale containing a little muscovite	1100 - 1138
25	Shale, greenish-gray, silty, with considerable interbedded dark- to very dark-gray shale	1138 - 1163
41	Shale, dark-gray, with considerable interbedded greenish-gray silty shale	1163 - 1204
34	Shale, greenish-gray, silty, with considerable interbedded dark- to very dark-gray shale	1204 - 1238
157	Shale, dark- to very dark-gray, containing a few minute pyrite pellets, with some interbedded greenish-gray silty shale	1238 - 1395
10	Shale, dark-gray, with a little interbedded grayish-black shale	1395 - 1405
48	Shale, gray- to dark-gray, with some interbedded very dark-gray shale	1405 - 1453
	Huron shale, 397 feet	
7	Shale, grayish-black, with a little interbedded gray shale	1453 - 1460
7	Shale, very dark-gray to grayish-black with some interbedded gray shale	1460 - 1467
53	Shale, very dark-gray to grayish-black	1467 - 1520
50	Shale, very dark-gray, with considerable interbedded gray shale containing some minute pyrite pellets	1520 - 1570

Armstrong No. 8

Thickness Feet	Desoription of Strata	Depth in feet
80	Shale, grayish-black, with some interbedded gray shale	1570 - 1650
120	Shale, brownish-black	1650 - 1770
16	Shale, brownish-black, containing minutely disseminated pyrite and abundant plant spores, with some interbedded greenish-gray shale	1770 - 1786
14	Shale, brownish-black, oontaining minutely disseminated pyrite and some plant spores	1786 - 1800
15	Shale, grayish-black, containing minutely disseminated pyrite	1800 - 1815
35	Shale, grayish-black, with some interbedded light greenish-gray shale in part somewhat oalcareous	1815 - 1850
	Middle Devonian Series, 523 feet	
	Olentangy shale, 334 feet	
15	Shale, greenish-gray	1850 - 1865
50	Shale, dark-gray, slightly oalcareous	1865 - 1915
10	Shale, greenish-gray with a very little interbedded very fine, gray limestone	1915 - 1925
20	Shale, greenish-gray, slightly oaloareous	1925 - 1945
27	Shale, greenish-gray, with some interbedded grayish-black shale	1945 - 1972
36	Shale, dark- to very dark-gray	1972 - 2008
62	Shale, dark-gray. slightly oalcareous	2008 - 2070
114	No samples	2070 - 2184
	Onondaga limestone, 189 feet	
36	Limestone, light-brownish-gray, fine, orystalline, oontaining a very little light-bluish-gray, vitreous, dolomoldic chert and an ocoasional shell fragment	2184 - 2220
93	Limestone, very fine- to fine, orystalline, light-brownish-gray, oontaining oonsiderable light-bluish-gray dolomoldic vitreous ohert and ococasional shell fragments	2220 - 2313
55	Limestone, very fine, crystalline, light-brownish- to brownish-gray, somewhat magnesian, oontaining considerable light-gray vitreous, dolomoldic chert, some very fine, angular quartz grains and a very little glauoonite	2313 - 2368

Thickness Feet	Description of Strata	Depth in feet
5	Dolomite, very fine, dense, brownish-gray, containing considerable light-gray vitreous, dolomoldic chert and a very little glauconite	2368 - 2373
	SILURIAN SYSTEM, 1259 feet	
	Upper Silurian or Cayugan Series, 737 feet	
	Bass Island dolomite, 101 feet	
30	Dolomite, very fine, dense, brownish-gray, somewhat argillaceous	2373 - 2403
33	Dolomite, very fine, crystalline, grayish-brown	2403 - 2436
38	Limestone, very fine, crystalline, light-grayish-brown, argillaceous and dolomitic, containing some light-bluish-gray vitreous chert. First water at 2447.	2436 - 2474
	Salina formation, 636 feet	
32	Limestone, very fine, dense, dark- to very dark-grayish-brown, argillaceous and dolomitic, containing considerable very fine, crystalline, light-gray anhydrite	2474 - 2506
14	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, containing a little anhydrite	2506 - 2520
44	Limestone, very fine, dense, brownish-gray, argillaceous and somewhat magnesian, containing a little anhydrite	2520 - 2564
2	Anhydrite, very fine, crystalline, light-gray- to brownish-gray, argillaceous and dolomitic	2564 - 2566
14	No samples	2566 - 2580
47	Limestone, very fine, dense, light-grayish-brown- to grayish-brown, argillaceous and dolomitic, containing considerable anhydrite	2580 - 2627
10	Limestone, very fine, dense, grayish- to dark-grayish-brown, argillaceous and dolomitic, containing some anhydrite and a little salt	2627 - 2637
8	Anhydrite, very fine, crystalline, light-grayish-brown, argillaceous and dolomitic	2637 - 2645
66	Limestone, very fine, dense, light-grayish- to grayish-brown, argillaceous and dolomitic, containing some light-gray vitreous and in part dolomoldic chert	2645 - 2711
11	Salt, coarse, crystalline, light-gray	2711 - 2722

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
43	Limestone, very fine, dense, light-grayish-brown, dolomitic and somewhat argillaceous, containing some very fine, crystalline, light-gray anhydrite	2722 - 2765
20	Limestone, very fine, dense, light-grayish-brown, dolomitic and somewhat argillaceous, containing some very fine, crystalline, light-gray anhydrite and a little salt	2765 - 2785
11	No samples	2785 - 2796
9	Limestone, very fine, dense, light-grayish-brown, dolomitic and somewhat argillaceous, containing some very fine, crystalline, light-gray anhydrite and a little salt	2796 - 2805
9	No samples	2805 - 2814
15	Anhydrite, very fine, crystalline, light-grayish- to grayish-brown, with considerable interbedded very fine, dense, grayish-brown argillaceous and dolomitic limestone	2814 - 2829
13	Anhydrite, very fine, crystalline, light-grayish- to grayish-brown, with some interbedded very fine, dense, grayish-brown, argillaceous and dolomitic limestone	2829 - 2842
26	Limestone, very fine, dense, light-grayish-brown, argillaceous and dolomitic with considerable interbedded very fine crystalline, light-brownish-gray anhydrite	2842 - 2868
12	Anhydrite, very fine, crystalline, brownish-gray, with considerable interbedded very fine, dense, grayish-brown, argillaceous and dolomitic limestone	2868 - 2880
25	Limestone, very fine, dense, light-brownish-gray, argillaceous and dolomitic, with some interbedded very fine, crystalline, light-brownish-gray anhydrite	2880 - 2905
95	Dolomite, very fine, dense, brownish-gray, argillaceous, with some interbedded very fine, crystalline, light-brownish-gray anhydrite	2905 - 3000
44	Dolomite, very fine, dense, dark-brownish-gray, argillaceous, containing a little anhydrite	3000 - 3044
10	Dolomite, very fine, dense, light-brownish-gray, argillaceous, containing a little anhydrite	3044 - 3054

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
56	Dolomite, very fine, dense, brownish-gray, argillaceous containing some anhydrite	3054 - 3110
	Middle Silurian or Niagaran Series, 367 feet	
	Lockport-Guelph dolomite, 111 feet	
27	Dolomite, very fine, crystalline, light-brownish-gray, one barrel saltwater per hour at 3129-3139	3110 - 3137
10	Dolomite, very fine, crystalline, brownish-gray	3137 - 3147
38	Dolomite, very fine, crystalline, dark-brownish-gray	3147 - 3185
24	Dolomite, very fine, crystalline, brownish-gray	3185 - 3209
12	Dolomite, very fine, crystalline, brownish-gray, with some interbedded gray, somewhat dolomitic shale	3209 - 3221
	Clinton group, 256 feet	
51	Shale, dark-gray, somewhat dolomitic	3221 - 3272
28	Dolomite, very fine, crystalline, light-gray, argillaceous	3272 - 3300
59	Shale, gray, somewhat dolomitic	3300 - 3359
2	Dolomite, very fine, crystalline, brownish-gray	3359 - 3361
31	No samples	3361 - 3392
15	Limestone, very fine, crystalline, light-brownish-gray, somewhat argillaceous, containing a little light-gray, vitreous chert	3392 - 3407
2	Hematite, red, oolitic, and fossiliferous, somewhat calcareous	3407 - 3409
18	Shale, greenish-gray, with some interbedded very fine-grained, light-greenish-gray, slightly calcareous sandstone	3409 - 3427
7	Shale, dark-gray, with a little interbedded very fine, crystalline, gray, silty limestone	3427 - 3434
6	Sandstone, very fine-grained, light-gray, angular, quartzose	3434 - 3440
8	Shale, greenish-gray	3440 - 3448

Thickness Feet	Description of Strata	Depth in feet
9	Sandstone, very fine-grained, light-greenish-gray, quartzose and slightly calcareous	3448 - 3457
5	Shale, greenish-gray	3457 - 3462
6	Shale, gray, with a little interbedded very fine-grained light-gray sandstone, show of gas 3464-3468	3462 - 3468
9	Siltstone, light-greenish-gray with some interbedded greenish-gray silty shale	3468 - 3477
	Lower Silurian or Albion Series, 155 feet	
28	Sandstone, very fine-grained, light-gray	3477 - 3505
10	Shale, gray, with considerable interbedded very fine-grained, light-greenish-gray sandstone, show of oil and gas at 3511 feet	3505 - 3515
35	No samples; show of oil at 3535	3515 - 3550
12	Shale, gray- to dark-gray, with a little interbedded light-gray, slightly calcareous siltstone containing fragments of shells	3550 - 3562
4	Shale, dark-purplish-red, containing fragments of shells	3562 - 3566
19	Shale, greenish-gray	3566 - 3585
5	Shale, greenish-gray, with some interbedded very fine-grained, greenish-gray, somewhat calcareous siltstone, and a very little fossiliferous, red hematite	3585 - 3590
42	Shale, greenish-gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing fragments of shells	3590 - 3632
	ORDOVICIAN SYSTEM, 2092 feet	
	Upper Ordovician or Cincinnatian Series, 1371 feet	
	Top Queenston shale	3632
54	Shale, brick-red to dark-brick-red, somewhat calcareous, with a little interbedded greenish-gray, somewhat calcareous shale	3632 - 3686
269	Shale, brick-red, somewhat calcareous, with a little interbedded greenish-gray, somewhat calcareous shale and siltstone	3686 - 3955

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
	Bottom of Queenston shale	3955
15	Shale, greenish-gray, in part silty, somewhat calcareous	3955 - 3970
20	Shale, dark-gray, with some interbedded greenish-gray, somewhat calcareous, silty shale	3970 - 3990
20	Shale, greenish- to dark-greenish-gray, silty and somewhat calcareous	3990 - 4010
9	Limestone, very fine, brownish-gray, silty, containing abundant fragments of shells	4010 - 4019
29	Shale, dark-gray, in part silty and slightly calcareous, with some interbedded, very fine, dark-brownish-gray, silty limestone containing abundant fragments of shells	4019 - 4048
47	Shale, dark-gray- to dark-purplish-gray, with some interbedded dark-gray, slightly calcareous silty shale	4048 - 4095
7	Shale, dark-gray, with some interbedded, very fine, dark-brownish-gray, silty limestone, containing fragments of shells	4095 - 4102
78	Shale, greenish-gray, with a little interbedded, greenish-gray, somewhat calcareous siltstone, containing fragments of shells	4102 - 4180
368	Shale, gray, in part slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	4180 - 4548
29	Shale, dark-gray, in part slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	4548 - 4577
57	Shale, gray- to dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	4577 - 4634
101	Shale, dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone, containing fragments of shells	4634 - 4735
32	Shale, very dark-gray, somewhat calcareous	4735 - 4767
75	Shale, very dark-gray, almost black, calcareous, containing occasional fragments of shells	4767 - 4842
60	Shale, dark- to very dark-gray, somewhat calcareous, containing occasional fragments of shells	4842 - 4902

Thickness Feet	Description of Strata	Depth in feet
101	Shale, brownish-black, calcareous	4902 - 5003
	Middle Ordovician or Champlainian Series, 721 feet	
	Top of Trenton limestone,	5003
87	Limestone, very fine, crystalline, brownish- to dark-brownish-gray, somewhat argillaceous, containing abundant fragments of shells and a very little light-gray- to light-bluish-gray chert with some interbedded dark-brownish-gray shaly limestone - show of oil 5024, 5030 and 5049-5053	5003 - 5090
5	Limestone, very fine, dark-brownish-gray, shaly	5090 - 5095
6	Limestone, very fine, crystalline, dark-brownish-gray, containing fragments of shells	5095 - 5101
6	No samples	5101 - 5107
11	Limestone, very fine, brownish-gray, somewhat argillaceous, containing occasional fragments of shells, with some interbedded bentonite	5107 - 5118
19	Limestone, very fine, grayish-brown, somewhat argillaceous, containing occasional fragments of shells	5118 - 5137
17	Limestone, very fine, in part lithographic, brownish-gray, somewhat argillaceous, containing fragments of shells, with considerable interbedded light-greenish-gray bentonite, containing biotite	5137 - 5154
6	Limestone, lithographic, grayish-brown, somewhat argillaceous, containing fragments of shells	5154 - 5160
44	Limestone, very fine, brownish-gray, somewhat argillaceous, containing occasional fragments of shells, with considerable interbedded light-greenish-gray bentonite containing biotite	5160 - 5204
18	Limestone, very fine, brownish-gray, argillaceous, containing a little brownish-gray chert and occasional shell fragments	5204 - 5222
116	Limestone, lithographic, brownish-gray, containing occasional fragments of shells	5222 - 5338
31	Limestone, lithographic, light-brownish-gray, containing an occasional shell fragment	5338 - 5369
41	Limestone, lithographic, brownish-gray, containing some fragments of shells	5369 - 5410

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
26	Limestone, in part lithographic, and in part very fine, crystalline	5410 - 5436
29	Limestone, lithographic, grayish-brown	5436 - 5465
47	Limestone, in part lithographic and in part very fine, crystalline, containing fragments of shells	5465 - 5512
38	Limestone, lithographic, brownish-gray, containing some fragments of shells	5512 - 5550
34	Limestone, lithographic, light-brownish-gray, containing an occasional shell fragment	5550 - 5584
19	Limestone, lithographic, brownish-gray, containing an occasional shell fragment	5584 - 5603
38	Shale, greenish-gray, calcareous, with some interbedded brownish-gray, shaly limestone containing fragments of shells	5603 - 5641
60	Limestone, lithographic, brownish-gray, containing some fragments of shells	5641 - 5701
18	Limestone, very fine, light- to dark-brownish-gray, somewhat argillaceous, containing a few medium-sized, subrounded- to rounded and frosted quartz grains, with some interbedded greenish-gray shale	5701 - 5719
5	Shale, grayish-green	5719 - 5724
	CAMBRIAN SYSTEM, 392+ feet	
	Upper Cambrian Series, 392+ feet	
	Trempealeau formation, 392+feet	
6	Dolomite, very fine, sandy, with larger quartz grains, subrounded to rounded and frosted	5724 - 5730
14	Sandstone, fine- to medium-grained, light-gray, very dolomitic; quartz grains subangular- to subrounded, with many of larger grains frosted	5730 - 5744
7	Siltstone, light-gray, dolomitic, with considerable interbedded light-greenish-gray silty shale	5744 - 5751
9	Dolomite, very fine, crystalline, light-brownish-gray, sandy, containing a little glauconite	5751-5760

Armstrong No. 8

Thickness Feet	Description of Strata	Depth in feet
3	Dolomite, very fine, crystalline, slightly silty	5760 - 5763
11	Sandstone, very fine- to fine-grained, light-brownish-gray, dolomitic; many quartz grains subrounded; show of oil and gas, 5763-5767	5763 - 5774
18	Dolomite, very fine, crystalline, light-brownish- to brownish-gray, with a little interbedded light-grayish-green shale	5774 - 5792
59	Dolomite, very fine, crystalline, light-brownish- to brownish-gray, sandy - quartz grains very fine- to fine, subangular to subrounded, in part frosted; show of oil at 5799-5802	5792 - 5851
51	Dolomite, very fine, crystalline, dark-brownish-gray, argillaceous	5851 - 5902
41	Dolomite, very fine, crystalline, light-brownish- to brownish-gray, silty	5902 - 5943
11	Siltstone, brownish- and greenish-gray, with some interbedded, very fine, crystalline, brownish-gray, silty dolomite	5943 - 5954
11	Dolomite, very fine, crystalline, light-brownish- to brownish-gray, silty	5954 - 5965
19	Siltstone, gray, dolomitic, with considerable interbedded very fine, crystalline, light-brownish-gray, silty dolomite	5965 - 5984
22	Dolomite, very fine, crystalline, light-brownish-gray, somewhat silty	5984 - 6006
5	Shale, gray, silty, somewhat dolomitic	6006 - 6011
27	Dolomite, very fine, crystalline, light-brownish-gray, very silty; salt water at 6017-6032	6011 - 6038
12	Shale, dark-gray, dolomitic, with some interbedded, very fine, crystalline, light-brownish-gray, silty dolomite	6038 - 6050
60	Dolomite, very fine, crystalline, light-brownish-gray, containing some very fine, angular quartz grains, a few of the larger of which are rounded and frosted, and a few light-gray feldspar grains; saltwater at 6071-6083, rose 3000 feet	6050 - 6116
	Total Depth	6116

WELL-SAMPLE RECORD

NO.

52

WELL-SAMPLE RECORD

S. V. Krause No. 1 Well

Ohio Oil Company

Ashland County, Ohio, Tract 14, Ruggles Township, New London quadrangle, 1.19 miles north of 41° 00' N. Lat. and 1.20 miles west of 82° 20' W. Long.
Completed: 1945
Elevation: 1114 feet above sea-level
Total Depth: 5251 feet
Deepest formation: Mount Simon sandstone
Result: 260,000 cubic feet of gas and show of oil at 4420-4434 feet and 40 bailers of salt water per day at 4537-4543 feet in Trempeleau; hole full of salt water at 4683-4692 feet in Dresbach; 30 bailers of salt water per day at 4805-4814 feet and hole full of salt water at 5041-5048 feet in Eau Claire
Samples: 140 to 5251 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	MISSISSIPPIAN SYSTEM, 563+ feet	
	Cuyahoga formation, 391+ feet	
140	No samples	0 - 140
	Bottom of 13-3/4" casing set at 64 feet	
13	Shale, greenish-gray, silty, and in part slightly calcareous, containing some muscovite	140 - 153
7	Shale, dark-gray, containing some muscovite, with some interbedded greenish-gray siltstone	153 - 160
110	Shale, dark-gray, containing some muscovite	160 - 270
	Bottom of 10 inch casing set at 267 feet	
13	Shale, very dark-gray, containing some muscovite	270 - 283
108	Shale, dark-gray, containing some muscovite and occasional minute fragments of carbonized plant remains	283 - 391

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
	Sunbury shale, 25 feet	
14	Shale, dark- to very dark-gray, containing some muscovite	391 - 405
6	Shale, very dark-gray	405 - 411
5	Siltstone, greenish-gray, with some interbedded dark-gray shale containing some muscovite	411 - 416
	Berea sandstone, 42 feet	
5	Sandstone, very fine-grained, light-gray, containing a little muscovite	416 - 421
6	Siltstone, light-greenish-gray, containing some muscovite with some interbedded dark-gray shale	421 - 427
6	Shale, gray, containing some muscovite, with considerable interbedded very fine-grained, light-gray sandstone containing a little muscovite	427 - 433
12	Sandstone, very fine-grained, light-gray, containing a little muscovite	433 - 445
13	Sandstone, very fine-grained, light-gray, containing some minute fragments of carbonized plant remains, wit a little interbedded gray shale	445 - 458
	Bedford shale, 105 feet	
25	Shale, reddish-brown, with considerable interbedded greenish-gray shale	458 - 483
6	Shale, gray, with considerable interbedded very fine grained, light-gray sandstone containing some muscovite	483 - 489
18	Shale, reddish-brown, with a little interbedded greenish-gray silty shale	489 - 507
25	Shale, reddish-brown	507 - 532
15	Shale, brick-red	532 - 547
8	Shale, greenish-gray	547 - 555
8	Shale, gray, with some interbedded reddish-brown shale	555 - 563

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
	DEVONIAN SYSTEM, 914 feet	
	Upper Devonian Series, 623 feet	
	Cleveland shale, 101 feet	
41	Shale, grayish-black	563 - 604
7	Shale, very dark-gray	604 - 611
27	Shale, grayish-black	611 - 638
12	Shale, very dark-gray	638 - 650
14	Shale, grayish-black	650 - 664
	Chagrin formation, 206 feet	
17	Shale, very dark-gray	664 - 681
18	Shale, greenish-gray, with a little interbedded dark-gray shale	681 - 699
6	Shale, very dark-gray	699 - 705
7	Shale, gray, with some interbedded dark-gray shale	705 - 712
28	Shale, light-greenish-gray, in part silty	712 - 740
16	Shale, very dark-gray	740 - 756
7	Shale, light-greenish-gray, with considerable interbedded dark-gray shale	756 - 763
13	Shale, light-greenish-gray	763 - 776
25	Shale, light-gray, with a little interbedded very dark-gray shale	776 - 801
29	Shale, very dark-gray, with some interbedded gray shale	801 - 830
40	Shale, very dark-gray	830 - 870
	Huron shale, 316 feet	
166	Shale, grayish-black	870 - 1036
10	Shale, light-greenish-gray, with some interbedded grayish-black shale	1036 - 1046
31	Shale, grayish-black, with considerable interbedded light-greenish-gray shale	1046 - 1077

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Shale, very dark-gray	1077 - 1084
20	Shale, grayish-black, with a little interbedded light-greenish-gray shale	1084 - 1104
6	Shale, light-greenish-gray	1104 - 1110
28	Shale, grayish-black	1110 - 1138
32	Shale, light-greenish-gray, with a little interbedded grayish-black, slightly calcareous shale	1138 - 1170
16	Shale, light-greenish-gray, with considerable interbedded very dark-gray shale	1170 - 1186
	Middle Devonian Series, 234 feet	
	Olentangy shale, 66 feet	
7	Shale, light-greenish-gray, somewhat calcareous	1186 - 1193
7	Shale, light-greenish-gray, with a little interbedded very fine, dense, brownish-gray, argillaceous limestone	1193 - 1200
52	Shale, gray, calcareous, containing occasional shell fragments	1200 - 1252
	Delaware limestone, 28 feet	
18	Limestone, very fine, dense, mottled, light-gray and brownish-gray, argillaceous, containing some light-gray chert	1252 - 1270
10	Limestone, very fine, dense, mottled light- and dark-brownish-gray, somewhat argillaceous, containing some very dark-grayish-brown, almost black, dense chert	1270 - 1280
	Columbus limestone, 197 feet	
5	Limestone, very fine, dense, very dark-grayish-brown	1280 - 1285
70	Limestone, very fine, dense, very light-brownish-gray, slightly argillaceous, containing a little light-gray chert and fragments of shells	1285 - 1355
65	Limestone, very fine, dense, light-grayish-brown, slightly argillaceous, containing some light-gray to white chert and fragments of shells	1355 - 1420
19	Limestone, very fine, crystalline, very light-brownish-gray, magnesian, and slightly argillaceous, containing some light-brownish-gray to white chert and very fine angular quartz sand and silt	1420 - 1439

Thickness Feet	Description of Strata	Depth in feet
16	Limestone, very fine crystalline, very light-gray, almost white to brownish-gray, magnesian, containing a great deal of light-gray to white chert and considerable very fine to fine, angular quartz sand	1439 - 1455
22	Limestone, very fine, dense, light-brownish-gray, magnesian, argillaceous, containing a little light-gray to white chert	1455 - 1477
	SILURIAN SYSTEM, 1013 feet	
	Upper Silurian or Cuyugan Series, 637 feet	
	Bass Islands dolomite, 56 feet	
34	Dolomite, very fine, crystalline, light-grayish-brown	1477 - 1511
22	Limestone, very fine, dense, light-gray to light-grayish-brown, dolomitic and somewhat argillaceous	1511 - 1533
	Salina formation, 581 feet	
48	Limestone, very fine, dense, light-grayish-brown, argillaceous and dolomitic, with considerable interbedded very fine-crystalline, light-gray to white anhydrite	1533 - 1581
	Bottom 8-5/8" casing, 1553 feet	
52	Shale, light-greenish- to greenish-gray, slightly calcareous, with considerable interbedded very fine, dense, light-brownish-gray argillaceous and dolomitic limestone and some very fine-crystalline, light-gray anhydrite	1581 - 1633
19	Limestone, very fine, dense, light-grayish-brown, dolomitic and somewhat argillaceous, with some interbedded very fine-crystalline, light-grayish-brown to white anhydrite	1633 - 1652
14	Limestone, very fine, dense, light-grayish-brown, dolomitic and somewhat argillaceous, with considerable interbedded very fine, crystalline, light-gray anhydrite and some greenish-gray, slightly calcareous shale	1652 - 1666
131	Dolomite, very fine, dense, light-grayish-brown, somewhat argillaceous, with considerable interbedded very fine-crystalline, light-grayish-brown to white anhydrite	1666 - 1797
27	Shale, gray, somewhat calcareous, with some interbedded very fine, dense, light-brownish- to brownish-gray argillaceous and dolomitic limestone and a little anhydrite	1797 - 1824
8	Shale, dark-greenish-gray, somewhat calcareous, with some interbedded anhydrite	1824 - 1832

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
43	Limestone, very fine, dense, dark-grayish-brown, argillaceous and dolomitic, with some interbedded dark-greenish-gray, somewhat calcareous shale and some anhydrite	1832 - 1875
86	Limestone, very fine, dense, grayish-brown, argillaceous and dolomitic, with considerable interbedded, very fine-crystalline, light-gray anhydrite	1875 - 1961
31	Dolomite, very fine, dense, dark-brownish-gray, with some interbedded gray, slightly calcareous shale and a little anhydrite	1961 - 1992
23	Dolomite, very fine, dense, light-brownish-gray	1992 - 2015
23	Dolomite, very fine, dense to crystalline, dark-grayish-brown, somewhat argillaceous, containing a little anhydrite	2015 - 2038
34	Dolomite, very fine, crystalline, grayish-brown, with a great deal of interbedded very fine-crystalline, light-gray anhydrite	2038 - 2072
12	Dolomite, very fine, dense, light-grayish-brown, with considerable interbedded very fine, crystalline, light-gray anhydrite	2072 - 2084
12	Dolomite, very fine, dense, grayish- to dark-grayish-brown, with a great deal of interbedded very fine-crystalline, light-gray anhydrite	2084 - 2096
18	Limestone, very fine, dense, very dark-grayish-brown, argillaceous and somewhat magnesian, with a great deal of interbedded very fine-crystalline, light-gray anhydrite	2096 - 2114
	Middle Silurian or Niagaran Series, 315 feet	
	Lockport-Guelph group, 171 feet	
52	Dolomite, very fine-crystalline, grayish-brown	2114 - 2166
29	Limestone, very fine, crystalline, light-grayish-brown, dolomitic, containing considerable dolomoldic chert	2166 - 2195
45	Limestone, very fine, crystalline, very light-grayish-brown, almost white, dolomitic, containing some chalk-textured chert	2195 - 2240
30	Limestone, very fine, crystalline, very light-grayish-brown, dolomitic, containing a great deal of chalk-textured chert	2240 - 2270
15	Limestone, fine, crystalline, light-brownish-gray, somewhat magnesian, containing a little clay and chalk-textured chert	2270 - 2285

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
	Clinton group, 144 feet	
15	Shale, gray, calcareous, with considerable interbedded fine, crystalline limestone, containing fragments of shells including crinoid stems	2285 - 2300
5	Shale, gray, calcareous, containing fragments of shells	2300 - 2305
5	Limestone, very fine, crystalline, light-grayish-brown, somewhat magnesian	2305 - 2310
6	Shale, gray	2310 - 2316
2	Limestone, very fine, dense, reddish-brown, ferruginous	2316 - 2318
17	Shale, gray	2318 - 2335
21	Shale, greenish-gray, silty and calcareous	2335 - 2356
7	Shale, gray, with a little interbedded very fine, dense, light-gray limestone containing fragments of shells	2356 - 2363
14	Shale, dark-purplish-gray, with considerable interbedded greenish-gray shale	2363 - 2377
15	Shale, dark-purplish-gray, with a great deal of interbedded greenish-gray shale and a little fine-crystalline light-gray limestone containing fragments of shells	2377 - 2392
11	Shale, dark-gray, with considerable interbedded greenish-gray shale and a little dense, gray limestone containing fragments of shells	2392 - 2403
6	Shale, dark-purplish-gray	2403 - 2409
20	Shale, greenish-gray, with a little interbedded dark-purplish-gray shale	2409 - 2429
	Lower Silurian or Albion Series, 61 feet	
	Brassfield limestone, 61 feet	
5	Limestone, fine, crystalline, gray, containing fragments of shells	2429 - 2434
28	Shale, greenish-gray, with a great deal of interbedded fine, crystalline, gray limestone containing fragments of shells	2434 - 2462

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
28	Limestone, fine, crystalline, gray, containing fragments of shells, with some interbedded greenish-gray, somewhat calcareous shale	2462 - 2490
	ORDOVICIAN SYSTEM, 1928 feet	
	Upper Ordovician or Cincinnatian Series, 1268 feet	
232	Shale, brick-red, somewhat calcareous, with a little interbedded greenish-gray shale and siltstone --Queenston	2490 - 2722
44	Shale, dark-gray	2722 - 2766
15	Shale, dark-greenish-gray, silty, containing abundant fragments of shells	2766 - 2781
40	Shale, dark-gray, with a great deal of interbedded dark-grayish-brown calcareous siltstone containing abundant fragments of shells	2781 - 2821
81	Shale, dark-gray, slightly calcareous	2821 - 2902
61	Shale, dark-gray, slightly calcareous, with a little interbedded dark-gray siltstone containing fragments of shells	2902 - 2963
75	Shale, gray, slightly calcareous, containing fragments of shells	2963 - 3038
7	Shale, gray, with considerable interbedded gray calcareous siltstone containing abundant fragments of shells	3038 - 3045
144	Shale, gray, with some interbedded gray calcareous siltstone containing abundant fragments of shells	3045 - 3189
22	Shale, gray, slightly calcareous, containing fragments of shells	3189 - 3211
168	Shale, dark-gray, slightly calcareous, containing fragments of shells	3211 - 3379
29	Shale, dark- to very dark-gray, in part slightly calcareous	3379 - 3408
8	Shale, grayish-black, with considerable interbedded gray, slightly calcareous shale	3408 - 3416
53	Shale, grayish-black, with some interbedded dark-gray shale	3416 - 3469
37	Shale, grayish-black, somewhat calcareous, with a little interbedded dark-gray, slightly calcareous shale	3469 - 3506
31	Shale, grayish-black, somewhat calcareous	3506 - 3537

Thickness Feet	Description of Strata	Depth in feet
36	Shale, grayish-black, calcareous, containing ostracods	3537 - 3573
103	Shale, brownish-black, calcareous, containing fragments of shells	3573 - 3676
12	Limestone, very fine, dense, very dark-grayish-brown, argillaceous, containing fragments of shells, with considerable interbedded brownish-black, calcareous shale	3676 - 3688
70	Shale, brownish-black, calcareous, containing fragments of shells, also ostracods	3688 - 3758
	Middle Ordovician or Champlainian Series, 660 feet	
	Top of Trenton limestone, 3758 feet	
5	Limestone, very fine, dense, gray to dark-grayish-brown, argillaceous and slightly magnesian, containing abundant fragments of shells	3758 - 3763
	Bottom of 6-5/8" casing, 3763 feet	
55	Limestone, very fine, crystalline, grayish-brown, somewhat argillaceous and slightly magnesian, containing some light-gray to brownish-gray chert and abundant fragments of shells	3763 - 3818
35	Limestone, very fine, dense, brownish-gray, argillaceous and slightly magnesian, containing fragments of shells and a little brownish-gray chert	3818 - 3853
39	Limestone, very fine, dense, light-brownish-gray, argillaceous, containing fragments of shells, with some interbedded light-gray bentonite	3853 - 3892
26	Limestone, very fine, dense, brownish-gray, argillaceous, with some interbedded light-gray bentonite	3892 - 3918
20	Limestone, very fine, dense, light-brownish-gray, somewhat argillaceous, containing a little light-gray chert	3918 - 3938
28	Limestone, very fine, dense, light-brownish-gray, containing occasional fragments of shells	3938 - 3966
22	Limestone, very fine, dense, brownish-gray	3966 - 3988
74	Limestone, very fine, dense, light-brownish-gray, containing occasional fragments of shells	3988 - 4062
58	Limestone, very fine, dense, grayish-brown, containing occasional fragments of shells	4062 - 4120

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
191	Limestone, very fine, dense, light-brownish-gray	4120 - 4311
16	Limestone, very fine, dense, light-brownish-gray, with a little interbedded greenish-gray, slightly calcareous shale	4311 - 4327
46	Limestone, very fine, dense, light-brownish-gray, somewhat argillaceous and magnesian	4327 - 4373
16	Limestone, very fine, dense, grayish-brown, with some interbedded greenish-gray, calcareous shale	4373 - 4389
25	Limestone, very fine, dense, grayish-brown, with a great deal of interbedded grayish-green, somewhat calcareous shale	4389 - 4414
4	Shale, grayish-green	4414 - 4418
	CAMBRIAN SYSTEM 833+ feet	
	Upper Cambrian Series, 833+ feet	
	Trempealeau formation and Franconia, 265 feet	
22	Sandstone, very fine-grained, light-buff, almost white, quartzose and dolomitic — 260,000 cubic feet of gas per 24 hours L.O.F., with slight show of oil at 4420-4434, salt water at 4432 feet	4418 - 4440
16	Shale, gray, silty, with a great deal of interbedded light-gray siltstone containing some muscovite	4440 - 4456
8	Siltstone, light-brownish-gray, dolomitic	4456 - 4464
8	Sandstone, very fine-grained, light-buff, quartzose and dolomitic, with considerable interbedded greenish-gray shale	4464 - 4472
101	Dolomite, very fine, crystalline, light-buff, silty — 40 bailers salt water per day at 4537-4543	4472 - 4573
14	Dolomite, very fine, crystalline, brownish-gray, silty	4573 - 4587
7	Dolomite, very fine, crystalline, brownish-gray, silty, containing minute grains of glauconite	4587 - 4594
54	Dolomite, very fine, crystalline, light-grayish-brown, containing some fine quartz grains, the larger of which are rounded and frosted	4594 - 4648

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
22	Dolomite, very fine, crystalline, light-grayish-brown, containing a great deal of fine-grained quartz sand, some of the larger grains of which are rounded and frosted	4648 - 4670
13	Dolomite, very fine, crystalline, light-buff, containing some fine quartz grains, some of which are rounded and frosted	4670 - 4683
	Dresbach sandstone, 57 feet	
7	Sandstone, fine- to medium-grained, light-buff, quartzose and dolomitic, many of quartz grains rounded and frosted	4683 - 4690
13	Sandstone, medium-grained, light-buff, quartzose and slightly dolomitic, with larger quartz grains rounded and frosted — hole full of salt water at 4683-4692	4690 - 4703
37	Sandstone, very fine- to fine-grained, light-buff, quartzose and somewhat dolomitic, with some of larger quartz grains rounded and frosted	4703 - 4740
	Eau Claire sandstone, 385 feet	
6	Sandstone, very fine- to fine-grained, light-buff, quartzose, with considerable interbedded dark-brownish-gray, somewhat dolomitic siltstone	4740 - 4746
16	Sandstone, very fine- to fine-grained, brownish-gray, quartzose and dolomitic, with some quartz grains rounded and frosted	4746 - 4762
10	Sandstone, very fine- to fine-grained, light-buff, quartzose and somewhat dolomitic, with some quartz grains rounded and frosted	4762 - 4772
22	Sandstone, very fine- to fine-grained, light-buff, quartzose and dolomitic, with some of larger grains rounded and frosted, with considerable interbedded dark-brownish-gray dolomitic siltstone containing a little glauconite	4772 - 4794
	Bottom of 5½" casing, 4780 feet	
23	Sandstone, very fine- to fine-grained, light-grayish-brown, quartzose and dolomitic, with some of quartz grains rounded and frosted - 30 bailers salt water per day at 4805-4814	4794 - 4817
44	Dolomite, very fine, crystalline, light-buff, containing a few very fine- to fine quartz grains, some of the larger of which are rounded and frosted	4817 - 4861
40	Dolomite, very fine, crystalline, light-grayish-brown, containing some very fine to fine quartz sand, some of quartz grains rounded and frosted	4861 - 4901

Krause No. 1

Thickness Feet	Description of Strata	Depth in feet
132	Dolomite, very fine, crystalline, light-brownish-gray, sandy, quartz grains very fine to fine, some rounded and frosted	4901 - 5033
52	Dolomite, very fine, crystalline, dark-grayish-brown, sandy, quartz grains very fine to fine, some rounded and frosted, many possess secondary crystal faces — hole full of salt water at 5041-5048	5033 - 5085
14	Sandstone, fine-grained, brownish-gray, quartzose and dolomitic, some of quartz grains rounded and frosted, many possess secondary crystal faces	5085 - 5099
7	Dolomite, very fine, crystalline, grayish-brown, sandy	5099 - 5106
8	Sandstone, fine- to medium-grained, dark-brownish-gray, quartzose and somewhat dolomitic, some of quartz grains rounded and frosted, many possess secondary crystal faces	5106 - 5114
11	Sandstone, fine- to medium-grained, brownish-gray, quartzose and dolomitic, some of quartz grains rounded and frosted, many possess secondary crystal faces	5114 - 5125
	Mount Simon sandstone, 126 feet	
11	Sandstone, fine- to medium-grained, light-gray, quartzose, some of quartz grains rounded and frosted, many possess secondary crystal faces	5125 - 5136
5	Sandstone, fine-grained, light-gray, quartzose and somewhat dolomitic, some of quartz grains rounded and frosted, many possess secondary crystal faces	5136 - 5141
33	Sandstone, fine- to medium-grained, light-gray, quartzose, some of grains rounded and frosted, many possess secondary crystal faces	5141 - 5174
77	Sandstone, medium-grained, light-gray, quartzose, with many grains rounded and frosted	5174 - 5251
	TOTAL DEPTH	5251

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

LOUIS BARLAGE NO. 1 WELL

OHIO OIL COMPANY

Putnam County, Ohio, Liberty Township, Center of S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of Section 29, T2N, R7E
Ottawa Quadrangle: .80 mile N 41° 5' N. Lat., and .40 mile W. 84° 5' W. Long.
Completed: March 21, 1944
Elevation: 740 feet above sea level
Total Depth: 3377 feet
Deepest formation: Jacobsville sandstone
Result: Show of oil at 1456 and 1462-1468 in Trenton; show of saltwater 1477-1482 in Trenton; saltwater rose 1100 feet at 2100 feet; and saltwater encountered at 2424 feet in Trempealeau.
Samples from 55 to 3377 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Pleistocene	
55	Clay, gray, silty, containing pebbles	0 - 55
	SILURIAN SYSTEM	
	Upper Silurian or Cayugan Series	
13	Dolomite, very fine, semi-lithographic, light-brownish-gray, argillaceous	55 - 68
10	Dolomite, very fine, semi-lithographic, light-brownish-gray, argillaceous, with a little interbedded light-gray to gray shaly dolomite	68 - 78
9	Shale, light-gray to gray, dolomitic, with a little interbedded semi-lithographic, light-brownish-gray dolomite	78 - 87
9	Dolomite, semi-lithographic, brownish-gray, argillaceous, with a little interbedded greenish-gray dolomitic shale	87 - 96

Louis Barlage No. 1

Thickness Feet	Description of Strata	Depth in feet
30	Shale, greenish-gray, dolomitic, with some interbedded light-brownish to brownish-gray, semi-lithographic dolomite	96 - 126
7	Dolomite, semi-lithographic, light-brownish to brownish-gray, with a little interbedded gray, shaly dolomite	126 - 133
17	Dolomite, semi-lithographic, light-brownish to brownish-gray, with a little interbedded gray, shaly dolomite	133 - 150
61	Dolomite, semi-lithographic, light-brownish-gray, very finely laminated and somewhat argillaceous	150 - 211
13	Dolomite, very fine-crystalline, grayish-brown, with a little interbedded greenish-gray shale	211 - 224
26	Dolmite, semi-lithographic, brownish-gray, with a little interbedded gray shale	224 - 250
21	Limestone, very fine-crystalline, grayish-brown, dolomitic with a very little interbedded gray shale	250 - 271
6	Limestone, semi-lithographic, brownish-gray, dolomitic	271 - 277
33	Dolomite, very fine-crystalline, light-brownish-gray	277 - 310
56	Dolomite, very fine, gray, shaly, with a little interbedded, very fine, crystalline, grayish-brown dolomite	310 - 366
13	Shale, dark-gray, somewhat dolomitic, with a little interbedded semi-lithographic grayish-brown dolomite	366 - 379
32	Dolomite, very fine, crystalline, light-grayish-brown, somewhat argillaceous	379 - 411
	Middle Silurian or Niagaran Series	
224	Dolomite, fine-crystalline, light-gray, nearly white	411 - 635

hickness Feet	Description of Strata	Depth in feet
	Lower Silurian or Albion Series, 68 feet	
	Cataract group, 68 feet	
	Brassfield limestone, 68 feet	
27	Dolomite, fine-crystalline, light-brownish-gray, argillaceous, with considerable interbedded fine-crystalline, light-brownish-gray, argillaceous dolomite	635 - 662
22	Limestone, very fine- to fine-crystalline, light- to dark-brownish-gray, argillaceous	662 - 684
14	Limestone, fine-crystalline, light-brownish-gray, dolomitic, with considerable interbedded light-greenish-gray, somewhat dolomitic clay	684 - 698
5	Clay, light-gray to gray, slightly dolomitic	698 - 703
	Upper Ordovician or Cincinnatian Series, 729 feet	
8	Shale, gray, silty and slightly dolomitic	703 - 711
24	Shale, greenish-gray to dark-gray, somewhat dolomitic	711 - 735
41	Shale, greenish-gray to dark-gray, somewhat calcareous with a little interbedded, very fine-crystalline, light-gray limestone. 8-5/8 inch casing set at 750 feet	735 - 776
42	Limestone, very fine-crystalline, gray, somewhat magnesian, containing abundant bryozoans, with considerable interbedded greenish-gray shale	776 - 818
5	Shale, greenish-gray	818 - 823
21	Limestone, very fine-crystalline, gray, somewhat magnesian, with some interbedded greenish-gray shale	823 - 844
91	Shale, greenish-gray to gray, with a little interbedded very fine-crystalline, gray limestone	844 - 935
12	Shale, gray, somewhat calcareous, with a little interbedded very fine, light-gray to gray limestone, containing fragments of shells	935 - 947

Thickness Feet	Description of Strata	Depth in feet
5	Limestone, very fine-crystalline, gray, somewhat argillaceous, containing fragments of shells	947 - 952
105	Shale, gray, with a little interbedded, very fine-crystalline, gray, somewhat argillaceous limestone containing fragments of shells	952 - 1057
18	Shale, gray to dark-gray, containing an occasional shell fragment	1057 - 1075
46	Shale, dark-gray, with a little interbedded very fine-crystalline limestone, containing fragments of shells, including bryozoans	1075 - 1121
66	Shale, gray, with some interbedded, very fine-crystalline limestone, containing abundant fragments of shells	1121 - 1187
50	Shale, gray to dark-gray, somewhat calcareous, containing fragments of shells	1187 - 1237
21	Shale, dark-gray, slightly calcareous	1237 - 1258
62	Shale, very dark-gray, slightly calcareous, with some interbedded, somewhat calcareous gray shale	1258 - 1320
100	Shale, very dark-gray, slightly calcareous	1320 - 1420
12	Shale, very dark-gray	1420 - 1432
	Middle Ordovician or Champlainian Series, 631 feet	
	Trenton limestone, 238 feet	
54	Limestone, fine-crystalline, light-brownish-gray, dolomitic, show of oil 1456, and 1462-1468, show of salt water 1477-1482	1432 - 1486
39	Dolomite, very fine-crystalline, light-brownish-gray	1486 - 1525
9	Limestone, very fine, dark-grayish-brown, somewhat argillaceous, containing fragments of shells, with a little interbedded dark-gray, slightly calcareous shale	1525 - 1534
46	Limestone, very fine, light-grayish- to dark-grayish-brown, containing fragments of shells	1534 - 1580

Louis Barlage No. 1

Thickness Feet	Description of Strata	Depth in feet
24	Limestone, very fine, grayish- to very dark-grayish-brown, somewhat argillaceous and magnesian, containing abundant fragments of shells, including bryozoans and a little light-gray chert	1580 - 1604
21	Limestone, very fine, mottled light- to dark-brownish-gray, containing abundant fragments of shells, with a very little interbedded light-greenish-gray, calcareous shale	1604 - 1625
29	Limestone, very fine, in part crystalline, mottled light- to dark-brownish-gray, somewhat argillaceous, containing fragments of shells with a little interbedded light-gray metabentonite	1625 - 1654
16	Limestone, very fine, light-grayish to grayish-brown, somewhat argillaceous, containing fragments of shells and a little light-bluish- to dark-brownish-gray chert. 7-inch casing set at 1670 feet.	1654 - 1670
	Black River limestone, 360 feet	
24	Limestone, very fine, light-grayish-brown	1670 - 1694
46	Limestone, lithographic, light-brownish-gray	1694 - 1740
10	Limestone, very fine, brownish-gray	1740 - 1750
95	Limestone, lithographic, light-gray to light-grayish-brown	1750 - 1845
10	Limestone, very fine, grayish to dark-grayish-brown	1845 - 1855
65	Limestone, very fine, light-brownish-gray, somewhat magnesian	1855 - 1920
80	Limestone, lithographic, brownish-gray, somewhat argillaceous	1920 - 2000
15	Limestone, very fine, light-brownish-gray	2000 - 2015
15	Limestone, lithographic, brownish-gray	2015 - 2030

Louis Barlage No. 1

Thickness Feet	Description of Strata	Depth in fee
	Glenwood formation, 33 feet	
23	Dolomite, very fine-crystalline, very light-brownish-gray	2030 - 2053
10	Shale, light-greenish-gray, somewhat dolomitic, with considerable interbedded light-greenish-gray, dolomitic siltstone	2053 - 2063
	CAMBRIAN SYSTEM, 1314 feet	
	Upper Cambrian Series, 1314 feet	
	Trempealeau formation, 502 feet	
35	Dolomite, very fine, very light-brownish-gray	2063 - 2098
254	Dolomite, very fine-crystalline, very light- to light-brownish-gray; hole full of water at 2100 feet	2098 - 2352
31	Dolomite, very fine- crystalline, brownish-gray	2352 - 2383
13	Dolomite, very fine-crystalline, dark-grayish-brown	2383 - 2396
44	Dolomite, very fine-crystalline, brownish-gray, somewhat argillaceous; show of saltwater at 2424 feet	2396 - 2440
12	Shale, gray, silty and somewhat dolomitic	2440 - 2452
43	Siltstone, brownish-gray, dolomitic	2452 - 2495
42	Dolomite, very fine-crystalline, somewhat argillaceous and silty	2495 - 2537
28	Dolomite, very fine-crystalline, sandy, containing a little glauconite	2537 - 2565
	Franconia sandstone, 25 feet	
25	Sandstone, fine- to medium-grained, brownish-gray, dolomitic, containing a little glauconite - quartz grains angular to sub-angular	2565 - 2590
	Dresbach sandstone, 10 feet	
10	Sandstone, fine- to medium-grained, brownish-gray, somewhat dolomitic - quartz grains angular to sub-angular	2590 - 2600

Louis Barlage No. 1

Thickness Feet	Description of Strata	Depth in feet
	Eau Claire sandstone, 350 feet	
22	Siltstone, light-brownish-gray, dolomitic, containing some glauconite, with considerable interbedded gray shale	2600 - 2622
18	Shale, gray, with a little interbedded purplish-gray shale	2622 - 2640
20	Shale, gray, with considerable interbedded light-brownish-gray, dolomitic siltstone, containing abundant glauconite	2640 - 2660
5	Siltstone, brownish- and greenish-gray, dolomitic, containing some glauconite, with some interbedded gray and greenish-gray shale	2660 - 2665
5	Shale, dark-purplish-gray, with considerable interbedded greenish-gray, dolomitic siltstone containing some glauconite	2665 - 2670
20	Sandstone, very fine-grained, gray, dolomitic, with some interbedded greenish-gray shale - $5\frac{1}{2}$" casing set at 2677 feet.	2670 - 2690
32	Siltstone, light-gray to brownish- and greenish-gray, dolomitic, containing a little glauconite, with considerable interbedded gray shale	2690 - 2722
11	Sandstone, very fine-grained, reddish-brown, somewhat dolomitic	2722 - 2733
19	Sandstone, fine- to medium-grained, brownish-gray, dolomitic, containing some glauconite - quartz grains angular to subangular	2733 - 2752
87	Sandstone, fine-grained, light-brownish-gray, somewhat dolomitic, containing a little glauconite - quartz grains angular to subangular	2752 - 2839
44	Siltstone, brownish- and purplish-gray, somewhat dolomitic, containing considerable glauconite, with some interbedded purplish-gray shale	2839 - 2883
17	Sandstone, very fine- to fine-grained, brownish-gray, somewhat dolomitic - quartz grains angular to subangular	2883 - 2900

Louis Barlage No. 1

Thickness Feet	Description of Strata	Depth in feet
7	Sandstone, medium-grained, light-gray, somewhat dolomitic quartz grains subangular	2900 - 2907
43	Sandstone, fine-grained, light-gray to light-brownish-gray, somewhat dolomitic - quartz grains subangular	2907 - 2950
	Mount Simon sandstone, 292 feet	
8	Sandstone, medium- to coarse-grained, light-gray - larger quartz grains subrounded	2950 - 2958
74	Sandstone, very fine-grained, light gray	2958 - 3032
25	Sandstone, fine-grained, light-gray, almost white	3032 - 3057
25	Sandstone, fine- to medium-grained, light-gray - larger quartz grains subrounded	3057 - 3082
10	Sandstone, coarse-grained, light-gray, many quartz grains subrounded	3082 - 3092
48	Sandstone, coarse- to very coarse-grained, light reddish gray - most of quartz grains subangular, a few rounded and frosted	3092 - 3140
79	Sandstone, medium- to coarse-grained, light-reddish-gray, many of larger quartz grains subrounded and frosted	3140 - 3219
23	Sandstone, fine-grained, light-reddish-gray, quartz grains subangular	3219 - 3242
	Jacobsville sandstone, 135 feet	
58	Sandstone, fine-grained, grayish-red, somewhat argillaceous, containing some pink orthoclase and a little muscovite	3242 - 3300
77	Arkose, grayish-red, composed of quartz, some partly altered pink orthoclase, and a little muscovite, all stained red by ferric oxide - quartz grains subangular to subrounded	3300 - 3377
	Total Depth	3377

WELL-SAMPLE RECORD

NO.

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WELL-SAMPLE RECORD

HARRY TAYLOR No. 1 WELL
WALTER H. ECKERT

Lenawee County, Michigan, Riga Township, S.E. 1/4, N.E. 1/4, S.W. 1/4, Section 32, T. 85., R. 5E.
Swanton Quadrangle: 1.14 miles south of 41° 45' N. Lat.
.97 mile west of 83° 50' W. Long.
Completed: April 17, 1944
Elevation: 715 feet above sea level
Total Depth: 3902 feet
Deepest formation: Pre-Cambrian
Result: Estimated 200,000 cubic feet of gas per day at 365-370 in Detroit River formation; fresh water at 1186 in Lockport dolomite; hole full of salt water at 2920 in Trempealeau formation
Samples: 995 to 3902 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
	SILURIAN SYSTEM	
	Upper Silurian or Cayugan Series, 115+feet	
	Salina formation, 115+feet	
995 feet	No samples	0 - 995
10	Dolomite, very fine, crystalline, light-grayish-brown	995 - 1005
23	Dolomite, very fine, dense, brownish-gray, argillaceous	1005 - 1028
11	Dolomite, very fine, dense, brownish-gray, argillaceous, with some interbedded very fine, crystalline, light-grayish-brown dolomite containing minute pores	1028 - 1039
10	Dolomite, very fine, dense, dark-brownish-gray argillaceous dolomite	1039 - 1049

Thickness Feet	Description of Strata	Depth in feet
41	Dolomite, very fine, dense, brownish-gray, argillaceous and minutely laminated	1049 - 1090
20	Dolomite, very fine, dense, dark-brownish-gray, argillaceous	1090 - 1110
	Middle Silurian or Niagaran Series	
	Lockport dolomite, 271 feet	
35	Dolomite, very fine-crystalline, grayish- to dark-grayish-brown	1110 - 1145
35	Dolomite, very fine- to fine-crystalline, very light-grayish-brown	1145 - 1180
77	Dolomite, very fine- to fine-crystalline, light-gray, almost white, containing a few fine subangular to rounded frosted quartz grains	1180 - 1257
116	Dolomite, very fine- to fine-crystalline, light-gray to nearly white	1257 - 1373
	Clinton group, 106 feet	
8	Dolomite, very fine-crystalline, mottled light-grayish- to grayish-brown	1373 - 1381
9	Dolomite, very fine-crystalline, brownish-gray, containing a little light-bluish-gray, dense chert	1381 - 1390
41	Dolomite, fine, crystalline, mottled light-gray to gray, somewhat argillaceous	1390 - 1431
20	Dolomite, fine-crystalline, light-buff-gray	1431 - 1451
28	Dolomite, fine-crystalline light-brownish-gray	1451 - 1479
	Lower Silurian Series, 84 feet	
	Manitoulin formation, 84 feet	
18	Shale, greenish-gray, somewhat dolomitic	1479 - 1497
3	Limestone, fine-crystalline, gray, dolomitic	1497 - 1500

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, gray, dolomitic, containing abundant fragments of shells	1500 - 1510
53	Shale, greenish-gray, somewhat dolomitic, with considerable interbedded very fine-crystalline, gray dolomite	1510 - 1563
	Upper Ordovician or Cincinnatian Series, 635 feet	
	Queenston shale, 117 feet	
37	Shale, greenish-gray, somewhat dolomitic, with some interbedded purplish-red, somewhat dolomitic shale, and a little very fine-crystalline, gray dolomite	1563 - 1600
10	Shale, gray	1600 - 1610
70	Shale, purplish-gray, with some interbedded gray shale, and a little very fine-crystalline, light-gray dolomite	1610 - 1680
	Lorraine shale, 387 feet	
54	Shale, greenish-gray, with a little interbedded fine-crystalline, light-gray to gray dolomite	1680 - 1734
56	Shale, gray, with a little interbedded fine-crystalline, light-gray to gray limestone containing fragments of shells	1734 - 1790
116	Shale, dark-gray, with a little interbedded very fine, crystalline, light-gray to gray limestone containing fragments of shells	1790 - 1906
10	Shale, very dark-gray	1906 - 1916
21	Shale, very dark-gray, with some interbedded very fine-crystalline, mottled light-gray to gray limestone	1916 - 1937
53	Shale, dark-gray, with a little interbedded fine-crystalline gray limestone	1937 - 1990
25	Shale, very dark-gray, with a little interbedded fine-crystalline, gray limestone containing fragments of shells	1990 - 2015
52	Shale, very dark-gray	2015 - 2067

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
	Utica shale, 131 feet	
131	Shale, grayish-black	2067 - 2198
	Middle Ordovician or Champlainian Series, 695 feet	
	Top Trenton limestone,	2198
61	Limestone, fine-crystalline, mottled light-brownish- to brownish-gray, magnesian, and somewhat argillaceous, containing fragments of shells	2198 - 2259
191	Limestone, very fine- to fine-crystalline, mottled light to dark-brownish-gray, somewhat argillaceous, containing fragments of shells	2259 - 2450
25	Limestone, very fine- to fine-crystalline, mottled light- to dark-brownish-gray, somewhat argillaceous, containing fragments of shells and some very dark-gray chert, with a little interbedded grayish-black calcareous shale	2450 - 2475
13	Limestone, very fine, grayish-green to very dark gray, argillaceous	2475 - 2488
135	Limestone, very fine, light-brownish- to brownish-gray, somewhat argillaceous and magnesian, containing a little light-gray chert and an occasional shell fragment	2488 - 2623
16	Limestone, very fine, light-brownish-gray, somewhat argillaceous and magnesian, with a little interbedded very dark-gray shale	2623 - 2639
67	Limestone, very fine, light-brownish-gray, somewhat magnesian	2639 - 2706
34	Limestone, lithographic, grayish-brown, somewhat magnesian, containing an occasional shell fragment	2706 - 2740
57	Limestone, very fine, very light-brownish-gray, somewhat magnesian	2740 - 2797
73	Limestone, very fine, brownish-gray, somewhat magnesian	2797 - 2870
23	Limestone, very fine, dark brownish-gray, somewhat magnesian, argillaceous in lower part	2870 - 2893

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
	CAMBRIAN SYSTEM, 962 feet	
	Upper Cambrian Series, 962 feet	
	Trempealeau formation, 371 feet	
26	Dolomite, very fine-crystalline, grayish- to dark-grayish-brown, somewhat sandy	2893 - 2919
20	Sandstone, very fine- to fine-grained, light-gray, dolomitic, quartz grains angular - hole full of salt water at 2920	2919 - 2939
73	Dolomite, very fine, crystalline, light-brownish-gray, somewhat sandy, quartz grains medium size, many rounded and frosted, some show secondary crystal faces	2939 - 3012
13	Dolomite, very fine-crystalline, light-brownish-gray, sandy, and containing considerable glauconite	3012 - 3025
107	Dolomite, very fine, crystalline, light-brownish-gray, slightly sandy	3025 - 3132
4	Siltstone, light-brownish-gray, somewhat dolomitic, and containing a little muscovite	3132 - 3136
29	Dolomite, very fine-crystalline, light-brownish-gray, somewhat silty, containing an occasional shell fragment	3136 - 3165
23	Dolomite, very fine-crystalline, light-gray, silty	3165 - 3188
40	Siltstone, in part shaly, brownish- to dark-greenish-gray, dolomitic	3188 - 3228
4	Siltstone, gray, dolomitic, containing some glauconite	3228 - 3232
32	Sandstone, very fine-grained, light brownish- to brownish-gray, dolomitic, with a few of the larger quartz grains rounded and frosted	3232 - 3264
	Franconia sandstone, 11 feet	
11	Sandstone, fine- to medium-grained, light-brownish-gray, somewhat dolomitic, with larger quartz grains rounded and frosted	3264 - 3275

Thickness Feet	Description of Strata	Depth in feet
	Dresbach sandstone, 94 feet	
23	Sandstone, coarse-grained, light-gray, with quartz grains mostly rounded to subrounded	3275 - 3298
9	Sandstone, coarse-grained, light-gray, with some interbedded dark-gray shale	3298 - 3307
15	Sandstone, fine- to medium-grained, very light-brownish-gray, somewhat dolomitic, quartz grains mostly angular, some exhibit secondary crystal faces	3307 - 3322
31	Sandstone, very fine-grained, light-gray to very light-brownish-gray	3322 - 3353
16	Sandstone, very fine-grained, very light-brownish-gray, with some interbedded gray siltstone	3353 - 3369
	Eau Claire sandstone, 242 feet	
12	Sandstone, very fine-grained, silty, gray, dolomitic, containing a little glauconite, with some interbedded dark-gray shale	3369 - 3381
12	Shale, dark-gray, with some interbedded gray dolomitic siltstone containing a little glauconite	3381 - 3393
9	Limestone, very fine-crystalline, light-gray to pink, silty, containing some glauconite	3393 - 3402
28	Siltstone, brownish-gray, dolomitic, containing a little glauconite	3402 - 3430
15	Sandstone, very fine-grained, brownish-gray, somewhat dolomitic, containing considerable glauconite, with some interbedded gray shale	3430 - 3445
9	Dolomite, very fine-crystalline, pink, containing abundant medium-grained, subrounded to rounded frosted quartz grains	3445 - 3454
19	Sandstone, fine- to medium-grained, light-gray to light-pink, with most of larger quartz grains subrounded to rounded	3454 - 3473

Taylor No. 1

Thickness Feet	Description of Strata	Depth in feet
9	Sandstone, coarse-grained, light-gray, with subrounded to rounded quartz grains	3473 - 3482
22	Sandstone, medium- to coarse-grained, light-gray, with subrounded to rounded quartz grains	3482 - 3504
31	Sandstone, fine-grained, light-gray, with a little interbedded greenish- and reddish-gray shale	3504 - 3535
58	Sandstone, very fine- to fine-grained, light gray, slightly dolomitic, containing considerable glauconite, with some interbedded gray, silty shale	3535 - 3593
18	Siltstone, light-gray to gray, somewhat dolomitic, with considerable interbedded gray shale	3593 - 3611
	Mount Simon sandstone, 244 feet	
76	Sandstone, medium- to coarse-grained, light-gray, quartz grains, subangular	3611 - 3687
8	Sandstone, very fine-grained, light-gray, with some interbedded medium- to coarse-grained, light-gray sandstone	3687 - 3695
117	Sandstone, medium- to coarse-grained, light-gray, with some of larger quartz grains subrounded and frosted	3695 - 3812
43	Sandstone, coarse-grained, light-gray, with quartz grains subrounded to rounded	3812 - 3855
	Pre-Cambrian, 47 feet	
24	Granite, weathered, red to reddish-gray	3855 - 3879
23	Granite, pink to red, containing pink orthoclase, quartz, some hornblende and a little biotite	3879 - 3902
	TOTAL DEPTH	3902

WELL-SAMPLE RECORD

NO.

55

WELL-SAMPLE RECORD

TROY-RODDENBERRY COM. NO. 1 WELL
I. C. CHALMESS

Washtenaw County, Michigan, Salem Township, N.E. 1/4, S.E. 1/4, N.E. 1/4, Section 27, T. 1 S., R. 7 E.
South Lyon Quadrangle: 3.10 miles south of 42° 25' N. Lat. and .27 mile west of 83° 35' W. Long.
Completed: November 15, 1944.
Elevation: 886 feet above sea level.
Total Depth: 6094 feet.
Deepest formation: Pre-Cambrian
Result: Show of gas at 5925 feet and hole full of water at 6000 feet in Mount Simon.
Samples: 287 to 6082 feet examined by Chas. R. Fettke.

Thickness Feet	Description of Strata	Depth in feet
	Pleistocene, 287 feet	
287	No samples	0 - 287
	MISSISSIPPIAN SYSTEM, 373+ feet	
	Coldwater shale, 133+ feet	
10	Sandstone, very fine grained, light greenish gray	287 - 297
28	Shale, gray, sandy	297 - 325
10	Shale, gray, silty, with considerable interbedded very fine grained light greenish gray sandstone	325 - 335
20	Shale, gray, sandy, containing minute fragments of carbonized plant remains	335 - 355
40	Shale, greenish-gray, sandy, with some interbedded dark-gray shale	355 - 395
5	Shale, dark-gray, silty, containing an occasional fragment of a shell, with some interbedded greenish-gray sandy shale	395 - 400

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
20	Shale, greenish-gray, sandy, with considerable interbedded dark-gray shale	400 - 420
	Sunbury shale, 20 feet	
20	Shale, grayish-black	420 - 440
	Berea formation, 170 feet	
5	Sandstone, very fine grained, light greenish-gray, containing some minutely disseminated pyrite	440 - 445
10	Sandstone, very fine grained, light-gray, very slightly calcareous, containing some muscovite	445 - 455
32	Shale, dark-gray, in part silty	455 - 487
33	Sandstone, very fine grained, light-gray, with considerable interbedded dark-gray shale	487 - 520
40	Sandstone, very fine grained, light-gray, containing a little muscovite, with a little interbedded dark-gray shale	520 - 560
25	Shale, dark-gray, in part silty, with considerable interbedded very fine grained light-gray sandstone	560 - 585
15	Shale, dark-gray, with some interbedded very fine grained light-gray sandstone	585 - 600
10	Sandstone, very fine grained, light-gray, containing a little muscovite, with a great deal of interbedded dark-gray shale	600 - 610
	Bedford shale, 50 feet	
50	Shale, dark-gray	610 - 660
	DEVONIAN SYSTEM, 947 feet	
	Upper Devonian Series, 152 feet	
	Antrim black shale, 152 feet	
130	Shale, grayish-black, containing minutely disseminated pyrite and spore cases	660 - 790

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
10	Shale, gray, slightly calcareous, containing an occasional fragment of a crinoid stem	790 - 800
12	Shale, grayish-black, with some interbedded gray slightly calcareous shale containing an occasional fragment of a shell	800 - 812
	Middle Devonian Series, 795 feet	
	Traverse group, 202 feet	
8	Shale, light-gray to gray, slightly calcareous, containing fragments of shells	812 - 820
12	Shale, dark brownish gray, silty and slightly calcareous, with some interbedded gray slightly calcareous shale	820 - 832
6	Limestone, very fine, crystalline, light-gray, almost white, dolomitic	832 - 838
26	Limestone, very fine, crystalline, light brownish gray, somewhat magnesian, containing a great deal of light-gray subchalcedonic chert	838 - 864
13	Limestone, very fine, dense to fine crystalline, brownish-gray, somewhat magnesian, containing a considerable quantity of medium to coarse subrounded and frosted quartz grains	864 - 877
81	Limestone, very fine, dense, brownish-gray, argillaceous, containing fragments of shells	877 - 958
10	Limestone, brownish-gray, shaly, containing occasional medium to coarse subrounded and frosted quartz grains and abundant fragments of shells	958 - 968
9	Limestone, very fine, dense, brownish-gray, argillaceous, containing considerable quantities of medium subrounded and frosted quartz grains and abundant fragments of shells	968 - 977
37	Limestone, gray to brownish-gray, shaly, containing abundant fragments of shells	977 - 1014
	Dundee formation, 151 feet	
5	Limestone, very fine, crystalline, light brownish gray	1014 - 1019

Thickness Feet	Description of Strata	Depth in feet
73	Limestone, very fine, dense, light-buff, containing occasional medium to coarse rounded and frosted quartz grains and fragments of shells	1019 - 1092
56	Limestone, very fine, crystalline, light-buff, magnesian	1092 - 1148
10	Dolomite, very fine, crystalline, light grayish brown, containing a few very fine quartz grains	1148 - 1158
7	Limestone, very fine, dense, grayish-brown, somewhat magnesian, minutely laminated, containing a few very fine angular quartz grains some of which show secondary crystal faces	1158 - 1165
	Detroit River formation, 235 feet	
16	Limestone, very fine, crystalline, light grayish brown, dolomitic, containing considerable anhydrite and a considerable number of light brownish gray siliceous oolites	1165 - 1181
29	Limestone, very fine, crystalline, light grayish brown, dolomitic, containing some anhydrite	1181 - 1210
27	Limestone, very fine, dense to crystalline, light-buff, dolomitic, containing a very little anhydrite	1210 - 1237
85	Limestone, very fine, crystalline, light-buff, dolomitic, containing a very little anhydrite	1237 - 1342
58	Limestone, very fine, crystalline, light grayish brown, dolomitic, containing some fine to medium subrounded and frosted quartz grains with occasional secondary crystal faces and a little light-gray dolomodic chert in lower part	1342 - 1400
	Sylvania sandstone, 186 feet	
71	Sandstone, fine- to medium-grained, light-gray, quartzose with most of quartz grains rounded and frosted with considerable interbedded very fine grained light-buff somewhat dolomitic sandstone	1400 - 1471

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in Feet
45	Sandstone, very fine to fine-grained, light-buff, somewhat dolomitic, with larger quartz grains subrounded and frosted	1471 - 1516
22	Sandstone, medium-grained, light-gray, quartzose, with quartz grains rounded and frosted, with some interbedded very fine grained light-buff somewhat dolomitic sandstone	1516 - 1538
48	Sandstone, medium-grained, light-gray, quartzose, with quartz grains subrounded and frosted and many exhibiting secondary crystal faces	1538 - 1586
	Bois Blanc formation (Onondaga), 21 feet	
21	Chert, light grayish brown, subchalcedonic, with some associated very fine, dense, light grayish to grayish-brown dolomite	1586 - 1607
	SILURIAN SYSTEM, 1913 feet	
	Upper Silurian or Cayugan Series, 1593 feet	
	Bass Island dolomite, 258 feet	
52	Dolomite, very fine, dense, light-buff, somewhat argillaceous	1607 - 1659
133	Dolomite, very fine, dense, light-buff, containing a little anhydrite	1659 - 1792
13	Dolomite, very fine, dense, light-buff, argillaceous, containing some anhydrite	1792 - 1805
22	Limestone, very fine, dense, brownish-gray, dolomitic, containing a little anhydrite	1805 - 1827
11	Limestone, very fine, dense, dolomitic and somewhat argillaceous, containing a great deal of anhydrite	1827 - 1838
27	Dolomite, very fine, dense, light grayish brown, somewhat argillaceous, containing considerable anhydrite	1838 - 1865
	Salina formation, 1335 feet	
27	Limestone, brownish to dark brownish gray, dolomitic and shaly, containing some anhydrite	1865 - 1892

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
60	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, containing some anhydrite	1892 - 1952
15	Salt, coarse, crystalline, colorless to white	1952 - 1967
23	Salt, coarse, crystalline, colorless to white with some interbedded gray somewhat dolomitic shale	1967 - 1990
108	Salt, coarse, crystalline, colorless to light-gray, with a little interbedded gray somewhat dolomitic shale and a little brownish-gray argillaceous dolomite	1990 - 2098
11	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, containing a little anhydrite	2098 - 2109
8	Anhydrite, very fine, crystalline, light brownish gray, with some interbedded dolomitic limestone	2109 - 2117
32	Salt, coarse crystalline, colorless to light-gray, with some interbedded very fine, dense, brownish-gray dolomitic limestone	2117 - 2149
31	Salt, coarse, crystalline, colorless to light-gray	2149 - 2180
20	Dolomite, very fine, crystalline, grayish-brown, with considerable interbedded very fine, crystalline, white to light brownish gray anhydrite	2180 - 2200
14	Salt, coarse, crystalline, colorless to light-gray	2200 - 2214
23	Salt, coarse, crystalline, colorless to light-gray, with a little interbedded dark brownish gray argillaceous dolomite	2214 - 2237
23	Salt, coarse, crystalline, colorless to light-gray	2237 - 2260
20	Salt, coarse, crystalline, colorless to light-gray, with a little interbedded brownish-gray argillaceous dolomite	2260 - 2280
25	Dolomite, very fine, dense, brownish-gray, argillaceous, containing a little anhydrite	2280 - 2305

Thickness Feet	Description of Strata	Depth in feet
59	Dolomite, very fine, dense, grayish-brown, containing considerable anhydrite	2305 - 2364
30	Dolomite, very fine, crystalline, grayish-brown, in part finely laminated	2364 - 2394
33	Limestone, gray to brownish-gray, shaly and dolomitic, containing considerable anhydrite	2394 - 2427
40	Salt, coarse, crystalline, colorless to light-gray, with considerable interbedded brownish-gray shaly and dolomitic limestone	2427 - 2467
16	Shale, gray, dolomitic, containing some anhydrite	2467 - 2483
53	No samples	2483 - 2536
29	Limestone, very fine, dense, brownish-gray, argillaceous and dolomitic, containing some anhydrite	2536 - 2565
20	Salt, coarse, crystalline, colorless to light-gray	2565 - 2585
41	Salt, coarse, crystalline, colorless to light-gray, with considerable interbedded very fine, dense, grayish-brown dolomite	2585 - 2626
57	Salt, coarse, crystalline, colorless to light-gray, with some interbedded very fine, dense, brownish-gray argillaceous dolomite	2626 - 2683
12	Limestone, brownish-gray, shaly, containing some anhydrite	2683 - 2695
5	Salt, coarse, crystalline, colorless to light-gray, with a little interbedded brownish-gray shaly and dolomitic limestone	2695 - 2700
35	Limestone, brownish-gray, shaly and dolomitic, containing considerable anhydrite	2700 - 2735
58	Salt, coarse, crystalline, colorless to light-gray, with a little interbedded very fine, dense, dark grayish brown dolomite	2735 - 2793
31	Salt, coarse, crystalline, colorless to light-gray, with some interbedded very fine, dense, dark grayish brown dolomite	2793 - 2824

Thickness Feet	Description of Strata	Depth in feet
24	Anhydrite, very fine, crystalline, grayish-brown, with considerable interbedded very fine, dense, dark grayish brown, with considerable interbedded very fine, dense, dark grayish-brown dolomitic limestone	2824 - 2848
8	Dolomite, very fine, dense, grayish-brown, finely laminated, containing a great deal of anhydrite	2848 - 2856
17	Dolomite, very fine, crystalline, grayish-brown, somewhat argillaceous, containing some anhydrite	2856 - 2873
11	Limestone, very fine, crystalline, grayish-brown, dolomitic	2873 - 2884
87	Limestone, very fine, dense, brownish to dark brownish gray, dolomitic and somewhat argillaceous	2884 - 2971
39	Limestone, gray, shaly and dolomitic, in part finely laminated	2971 - 3010
43	Anhydrite, very fine, crystalline, white to light brownish gray, with some interbedded very fine, dense, brownish-gray limestone	3010 - 3053
49	Salt, coarse, crystalline, colorless to light-gray	3053 - 3102
13	Limestone, very fine, crystalline, dark grayish brown, dolomitic, containing a little anhydrite	3102 - 3115
69	Limestone, very fine, dense, dark brownish gray, dolomitic	3115 - 3184
16	Dolomite, very fine, dense, brownish-gray, containing considerable anhydrite	3184 - 3200
	Middle Silurian or Niagaran Series, 182 feet	
	Lockport-Guelph group, 44 feet	
	Engadine dolomite, 44 feet	
44	Dolomite, very fine, dense to crystalline, light brownish to brownish gray	3200 - 3244

Thickness Feet	Description of Strata	Depth in feet
	Clinton group, 138 feet	
	Manistique formation, 138 feet	
29	Dolomite, very fine, dense, light brownish gray, containing considerable light-gray to white subchalcedonic chert	3244 - 3273
81	Dolomite, very fine, crystalline, light-gray containing some light-gray to white subchalcedonic chert in upper part	3273 - 3354
16	Limestone, very fine, dense, brownish-gray, dolomitic and somewhat argillaceous containing fragments of shells with some interbedded brownish-gray, slightly dolomitic shale	3354 - 3370
12	Limestone, very fine, crystalline, light-gray, in part mottled with reddish-brown, dolomitic and somewhat argillaceous, with considerable interbedded light greenish gray slightly dolomitic shale	3370 - 3382
	Lower Silurian or Albion Series, 138 feet	
	Cabot Head shale, 70 feet	
20	Shale, brick-red, slightly dolomitic, containing fragments of shells, with some interbedded very fine, dense, gray dolomitic limestone	3382 - 3402
8	Shale, brick-red, slightly dolomitic, with some interbedded very fine, dense, light-gray to light reddish brown dolomitic limestone	3402 - 3410
12	Shale, gray, slightly dolomitic, with some interbedded very fine, crystalline, light brownish-gray dolomitic limestone	3410 - 3422
30	Limestone, very fine, crystalline, mottled light-gray and gray, dolomitic and somewhat argillaceous, with a great deal of interbedded gray shale	3422 - 3452
	Manitoulin dolomite, 68 feet	
18	Dolomite, fine, crystalline, light brownish gray	3452 - 3470

Thickness Feet	Description of Strata	Depth in feet
12	Limestone, very fine, crystalline, light brownish to brownish gray, dolomitic and somewhat argillaceous, containing some light-gray subchalcedonic chert and occasional fragments of shells, with a little interbedded dark-gray slightly calcareous shale	3470 - 3482
7	Dolomite, very fine, crystalline, mottled light brownish gray white, containing considerable light-gray subchalcedonic chert	3482 - 3489
11	Limestone, very fine, crystalline, light brownish gray, dolomitic	3489 - 3500
20	Limestone, very fine, crystalline, light brownish gray, dolomitic, with considerable interbedded gray shaly limestone	3500 - 3520
	ORDOVICIAN SYSTEM, 1499 feet	
	Upper Ordovician or Cincinnatian Series, 587 feet	
	Queenston shale, 215 feet	
19	Shale, purplish-red, somewhat calcareous	3520 - 3539
76	Shale, gray, somewhat calcareous, with some interbedded gray shaly limestone containing fragments of shells	3539 - 3615
120	Shale, purplish-gray to red, slightly calcareous, with some interbedded greenish-gray somewhat calcareous shale and a little very fine, crystalline, gray limestone containing fragments of shells	3615 - 3735
	Lorraine shale, 327 feet	
33	Shale, gray, slightly calcareous, with some interbedded very fine, crystalline limestone containing fragments of shells	3735 - 3768
93	Shale, gray to dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	3768 - 3861
71	Shale, gray, slightly calcareous, containing occasional shell fragments	3861 - 3932
130	Shale, gray to dark-gray, somewhat calcareous	3932 - 4062

Thickness Feet	Description of Strata	Depth in feet
	Utica shale, 45 feet	
45	Shale, dark to very dark gray, somewhat calcareous	4062 - 4107
	Middle Ordovician or Champlainian Series, 912 feet	
	Top of Trenton limestone	4107
45	Limestone, very fine to fine, crystalline, dark brownish gray, dolomitic, and somewhat argillaceous, containing abundant fragments of shells in upper part	4107 - 4152
39	Limestone, very fine, in part crystalline, brownish-gray, magnesian and somewhat argillaceous, containing fragments of shells	4152 - 4191
129	Limestone, very fine to fine, crystalline, mottled light brownish to brownish gray, somewhat magnesian and argillaceous, containing fragments of shells	4191 - 4320
115	Limestone, very fine, in part crystalline, mottled light to dark brownish gray, magnesian and slightly argillaceous, containing fragments of shells	4320 - 4435
100	Limestone, very fine, crystalline, mottled light brownish and brownish gray, somewhat argillaceous, containing fragments of shells, and a little light-gray chert, with some interbedded very dark gray shaly limestone	4435 - 4535
22	Limestone, very fine, grayish-brown, somewhat argillaceous, with some interbedded very dark gray, calcareous shale	4535 - 4557
110	Limestone, very fine, light grayish-brown, somewhat argillaceous, containing occasional fragments of shells and a little light-gray chert, in part drusy	4557 - 4667
38	Limestone, very fine, light brownish to brownish gray	4667 - 4705
102	Limestone, lithographic, light brownish- to brownish-gray, containing an occasional shell fragment	4705 - 4807
59	Limestone, very fine, grayish to dark grayish brown, somewhat argillaceous	4807 - 4866

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
80	Limestone, lithographic to very fine crystalline, light brownish to brownish gray	4866 - 4946
9	Limestone, lithographic, grayish-brown	4946 - 4955
43	Limestone, very fine, brownish-gray, some what argillaceous, containing a little light-gray chert	4955 - 4998
10	Limestone, very fine, dark grayish brown, argillaceous	4998 - 5008
11	Limestone, very fine, brownish-gray, silty and somewhat magnesian, with some interbedded dark-gray shale	5008 - 5019
	CAMBRIAN SYSTEM, 1052 feet	
	Upper Cambrian Series, 1052 feet	
	Trempealeau formation, 439 feet	
31	Dolomite, very fine, crystalline, light-gray, somewhat silty	5019 - 5050
70	Dolomite, very fine to fine, crystalline, light brownish gray, somewhat silty; 5 bailers of SALT WATER per hour, 5061-5073	5050 - 5120
20	Shale, light-gray to gray, somewhat dolomitic	5120 - 5140
12	Dolomite, very fine, crystalline, light brownish to brownish gray, silty	5140 - 5152
12	Limestone, very fine, dark brownish gray and argillaceous, dolomitic	5152 - 5164
94	Dolomite, very fine, crystalline, light brownish to brownish gray, somewhat silty and sandy	5164 - 5258
19	Dolomite, very fine, crystalline, brownish-gray, silty	5258 - 5277
43	Sandstone, very fine-grained, light brownish gray, somewhat dolomitic and containing a little muscovite, with some interbedded greenish-gray shale in lower part; 300 feet SALT WATER in 8 hours, 5289 -5300	5277 - 5320

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
48	Siltstone, brownish-gray, dolomitic	5320 - 5368
8	Siltstone, brownish-gray, slightly dolomitic, with some interbedded greenish-gray shale	5368 - 5376
32	Siltstone, light brownish to brownish gray, dolomitic, with some interbedded greenish-gray shale	5376 - 5408
50	Siltstone, light brownish to brownish gray, dolomitic	5408 - 5458
	Franconia sandstone, 17 feet	
10	Sandstone, very fine-grained, brownish-gray, somewhat dolomitic, containing considerable glauconite	5458 - 5468
7	Sandstone, coarse-grained, light-gray, containing some rounded quartz grains to 2 millimeters in diameter and considerable glauconite	5468 - 5475
	Dresbach sandstone, 110 feet	
47	Sandstone, fine- to medium-grained, angular, quartzose, light brownish gray; 300 feet SALT WATER, 5475-5481	5475 - 5522
63	Sandstone, very fine to fine-grained, angular, quartzose, light brownish-gray	5522 - 5585
	Eau Claire sandstone, 254 feet	
30	Sandstone, very fine-grained, brownish-gray, calcareous, containing considerable glauconite	5585 - 5615
33	Sandstone, very fine-grained, light brownish to brownish-gray, slightly dolomitic	5615 - 5648
15	Sandstone, very fine-grained, light brownisn gray	5648 - 5663
33	Sandstone, fine- to medium-grained, angular, quartzose, brownish-gray, slightly dolomitic, with a few of larger quartz grains rounded and frosted	5663 - 5696
22	Sandstone, fine-grained, angular, quartzose, light brownish gray, very slightly dolomitic	5696 - 5718

Troy-Roddenberry No. 1

Thickness Feet	Description of Strata	Depth in feet
16	Sandstone, fine-grained, light-gray	5718 - 5734
100	Sandstone, medium-grained, light-gray, very slightly dolomitic, with some of larger quartz grains rounded and frosted	5734 - 5834
5	Sandstone, medium-grained, light-gray to brownish-gray, somewhat dolomitic, with some of larger quartz grains rounded	5834 - 5839
	Mount Simon sandstone, 232 feet	
16	Sandstone, coarse-grained, light-gray, poorly sorted, with some of larger quartz grains rounded and frosted	5839 - 5855
21	Sandstone, medium-grained, light-gray, poorly sorted, with larger quartz grains rounded and frosted	5855 - 5876
49	Sandstone, medium- to coarse-grained, poorly sorted, with larger quartz grains rounded and frosted, show of GAS at 5925 feet	5876 - 5925
20	Sandstone, fine-grained, angular, quartzose, light-gray	5925 - 5945
24	Sandstone, medium-grained, light-gray, angular, quartzose	5945 - 5969
30	Sandstone, coarse-grained, poorly sorted, light-gray, with some of larger quartz grains subrounded to rounded and frosted	5969 - 5999
6	Sandstone, very fine to fine-grained, light-gray, with larger grains rounded and frosted hole full of SALT WATER at 6000 feet	5999 - 6005
20	Sandstone, coarse-grained, light-gray, with larger quartz grains subrounded to rounded and frosted	6005 - 6025
46	Sandstone, coarse-grained, light-gray, with larger quartz grains rounded and frosted, containing a few pink feldspar grains	6025 - 6071
	PRE-CAMBRIAN, 14 feet	
14	Chlorite schist, in part weathered	6071 - 6085
	TOTAL DEPTH	6085

OTHER WRITINGS OF CHARLES R. FETTKE PUBLISHED BY THE PENNSYLVANIA GEOLOGICAL SURVEY

Third Survey

Report
12 (1919). Glass Manufacture and the Glass Sand Industry. 278 pp., 108 pls.

Fourth Series

G 21 (1948). Subsurface Trenton and Sub-Trenton Rocks in Ohio, New York, Pennsylvania, and West Virginia. 35 pp. 7 figs. Reprinted from Bull. AAPG, vol. 32, no. 8.

G 27 (1954). Structure Contour Maps of the Plateau Region on North-central and Western Pennsylvania. 45 pp., 3 pls. Maps (1" = 6 mi.) showing surface and subsurface structure.

M 2 (1923). Oil Resources in Coals and Carbonaceous Shales of Pennsylvania. 119 pp., 6 pls., 16 figs. Describes the petroleum situation, explaining methods of distilling coal and shale, and gives results of tests on 122 samples of coal and shale.

M 21 (1938). Bradford Oil Field, Pennsylvania and New York. 454 pp., 21 pls., 113 figs., including 1 geologic map. Includes description of water-flooding operations.

M 28 (1946). Oil and Gas Developments in the North Strabane Area, Washington County, Pennsylvania, by Chas. R. Fettke, Robert C. Stephenson, and E. M. Tignor. 62 pp., 2 pls., 10 figs.

M 30 (1949). East Fork-Wharton Gas Field, Potter County, Pennsylvania, by John R. Ebright, Chas. R. Fettke, and A. I. Ingham. 44 pp., 1 pl., 2 figs.

M 31 (1950). Summarized Record of Deep Wells in Pennsylvania. 148 pp., 2 pls., 2 figs. Extra maps, M 31, pl. 1, 4 pts., per set.

M 33 (1950). Waterflooding in Pennsylvania. Reprinted from Secondary Recovery in the United States, A.P.I., 31 pp., 16 figs.

Report

M 37 (1953). Oil and Gas Developments in the Appalachian Basin Past and Present. 15 pp., 1 pl., 1 fig.

M 39 (1956). Summarized Records of Deep Wells in Pennsylvania 1950 to 1954. 114 pp., 5 pls., 6 tables, 1 fig.

SB 5 (1951). Oil and Gas Field of the Bradford Quadrangle, by Chas. R. Fettke and Virginia Fairall. 10 maps, 2 tables.

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PR 135 (1951). Oil and Gas Developments in Pennsylvania in 1950. 10 pp., 1 pl.

PR 139 (1952). Oil and Gas Developments in Pennsylvania in 1951. 20 pp., 2 pls., 4 figs.

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Report

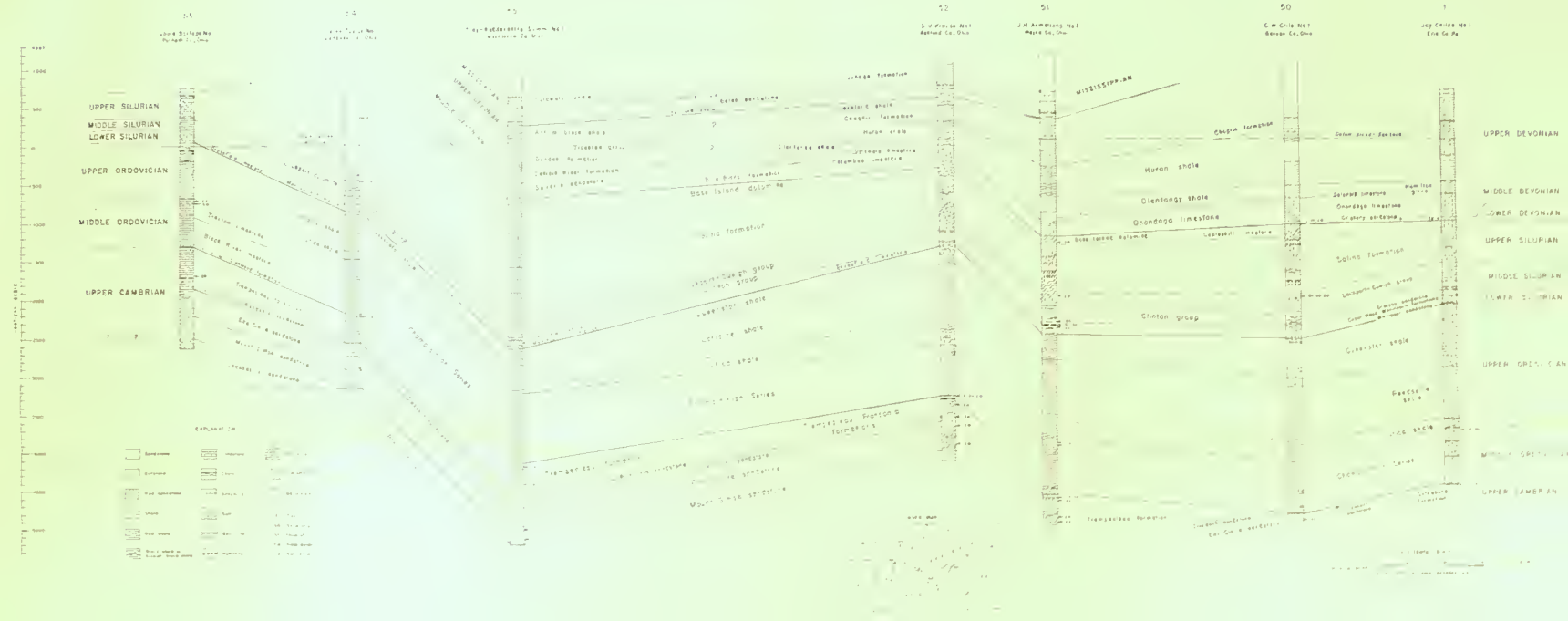
PR 144 (1954). Oil and Gas Developments in Pennsylvania in 1953. 15 pp., 2 pls.

PR 145 (1955). Occurrence of Rock Salt in Pennsylvania. Map with text on back.

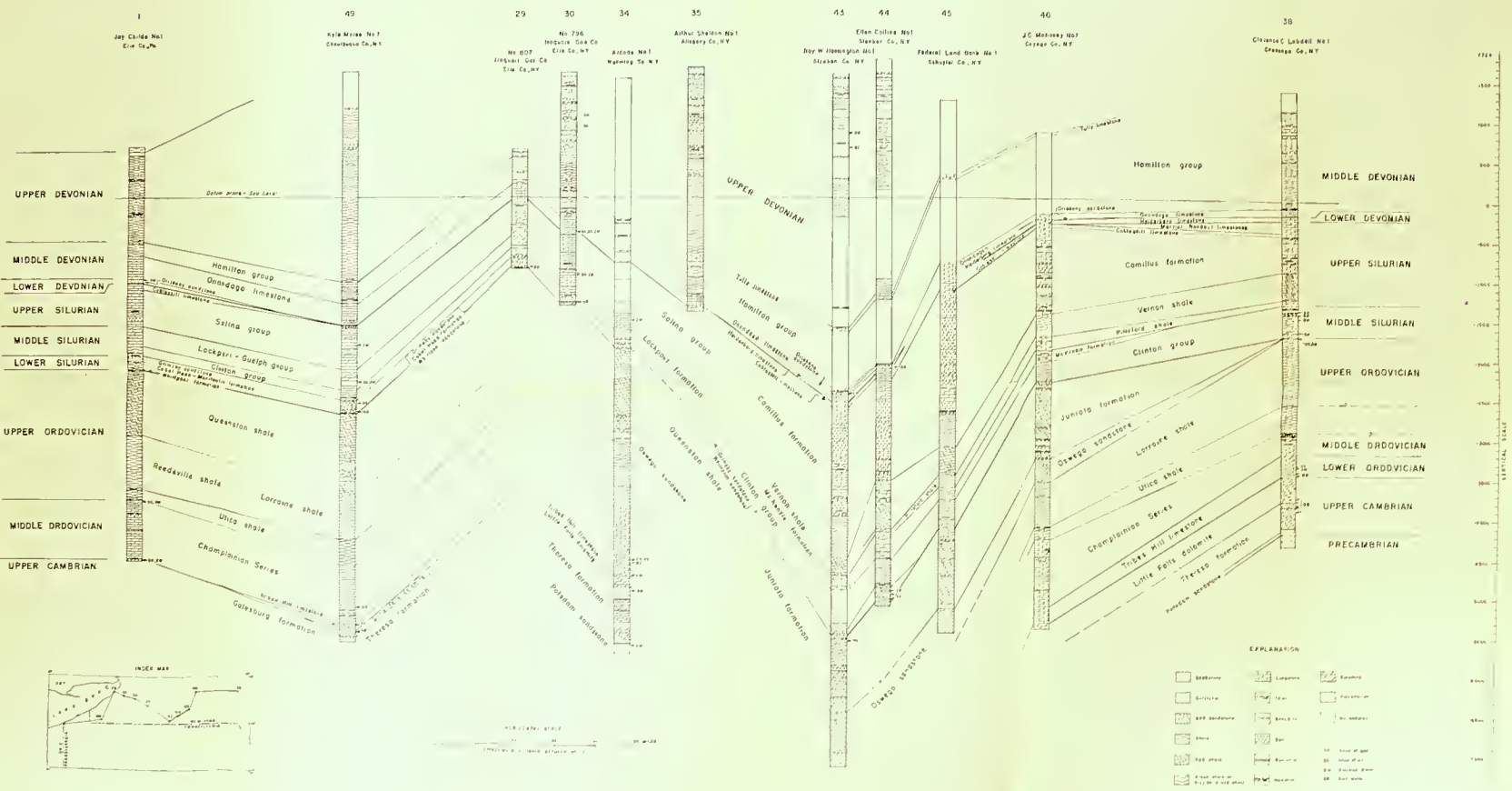
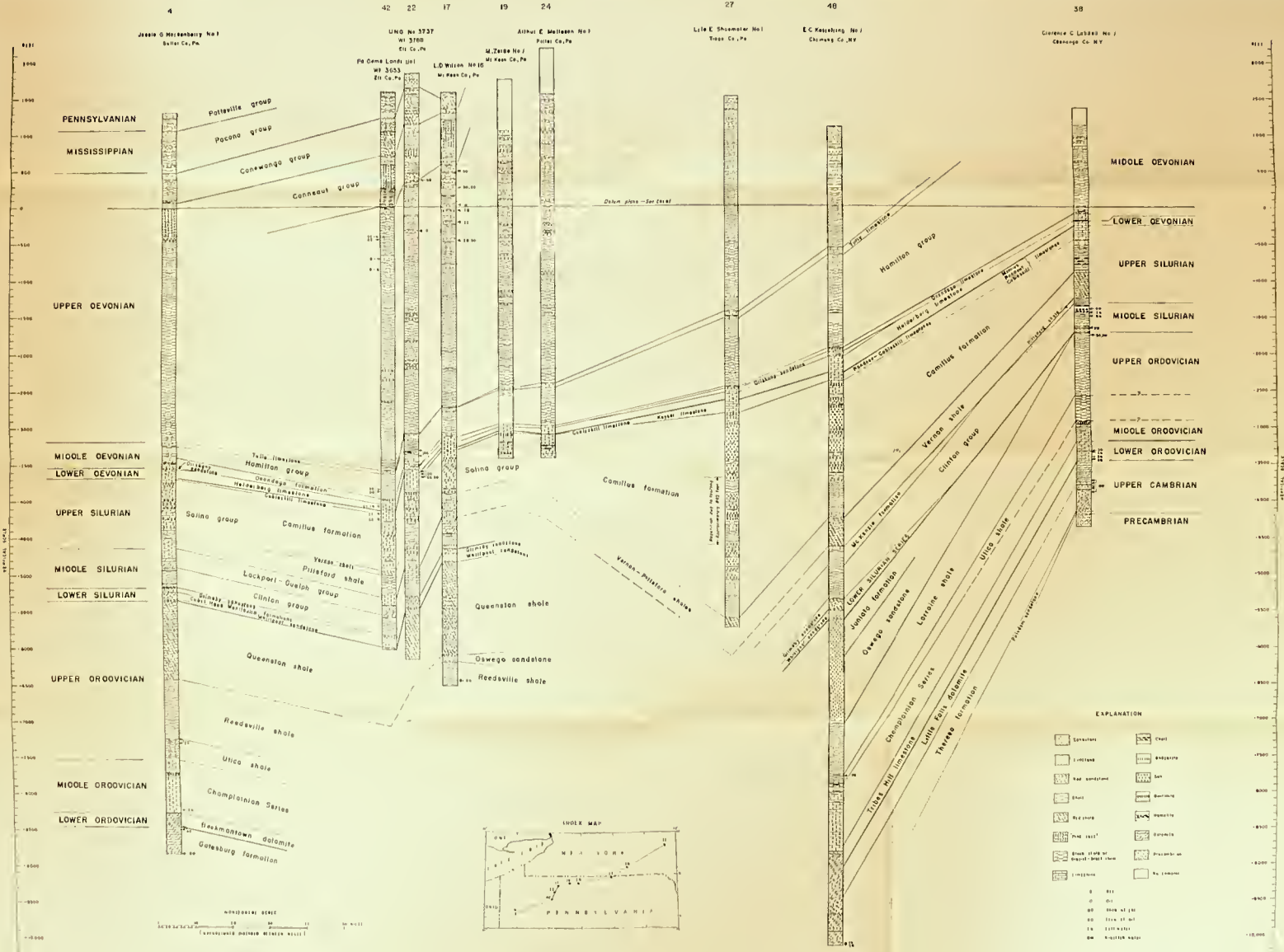
PR 147 (1955). Oil and Gas Developments in Pennsylvania in 1954, by Chas. R. Fettke and Wm. S. Lytle. 12 pp., 1 fig., reprinted from Bull. A. A. P. G.

PR 150 (1956). Oil and Gas Developments in Pennsylvania in 1955, by Chas. R. Fettke and Wm. S. Lytle. 8 pp., 2 pls.

CROSS-SECTION FROM PUTNAM COUNTY, OHIO TO ERIE COUNTY, PENNSYLVANIA



CROSS-SECTION FROM ERIE COUNTY, PENNSYLVANIA TO CHENANGO COUNTY, NEW YORK



CROSS-SECTION FROM BUTLER COUNTY, PENNSYLVANIA TO CHENANGO COUNTY, NEW YORK